OCTOBER
1961
•
35¢

AMERICAN Cinematographer

The Magazine of Motion Picture Photography

MAKING THE MOST OF LAB SERVICES

•

Filming Battle Scenes for "The Land We Love"

•

STUDY IN HORROR FILM PHOTOGRAPHY

•

SHOOTING EXTERIORS

Also: BEHIND THE CAMERAS • QUESTIONS & ANSWERS • WHAT'S NEW

PROFESSIONAL JUNIOR*—product of experience

and friend to thousands of cameramen

All tripods have one thing in common—they rest on three legs. But there the the comparison ends.

Because PRO JUNIOR towers like the Empire State Building over ordinary tripods.

Because PRO JUNIOR is the world's most *convenient* tripod with the world's finest features, including:

- Simplified camera attaching method
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- Special pan tension adjusting knob, independent of pan lock
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- Self-adjusting double leg locking knobs.
- IDEAL FOR MOTION PICTURE AND TV VIDICON CAMERAS.

And still the price is unchanged, which makes PRO JUNIOR the world's best tripod value. Pros go for PRO JUNIOR. See it today.
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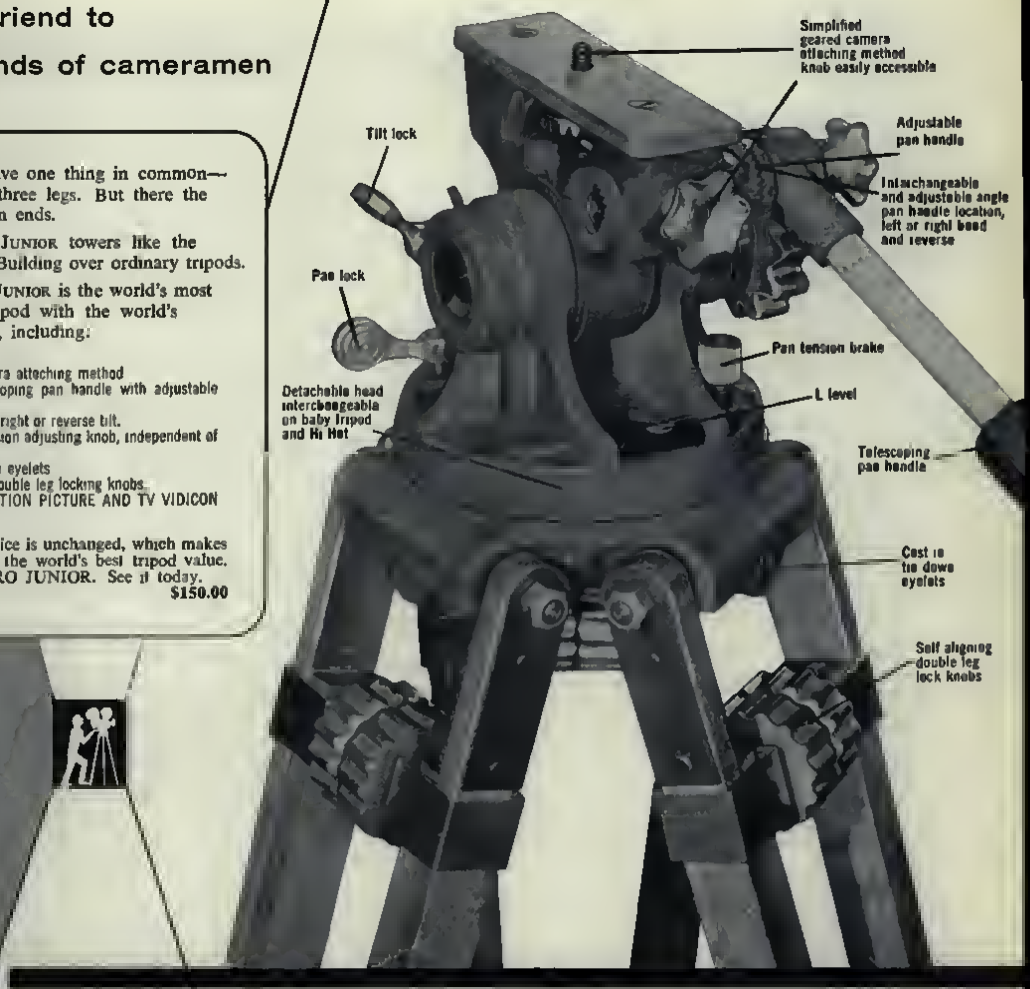

CECO Professional Jr. HI-Hat

An adapter for extremely low-mount setups; also used for title stands and permanent mountings. Handles either friction or geared-drive tripod heads **$22.00**

CECO Professional Jr. Adjustable Wooden Baby Tripod

Accepts all Pro Jr. Tripod Heads. Has substantial shoe and spur. Measures 26" extended from floor to flange, 18" collapsed. Weight 7 lbs. **$75.00**

PROFESSIONAL JR. Geared Head

Used on Professional Jr. standard tripod. Crank handles control pan and tilt action.
$175.00 Head only.
$225.00 Complete with tripod.

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CAMERA EQUIPMENT CO., INC.

Dept. A 315 West 43rd St, New York 36, N. Y. JUdson 6-1420

AMERICAN

Cinematographer

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October, 1961 **Vol. 42, No. 10**

Feature Articles

Departments

ON THE COVER

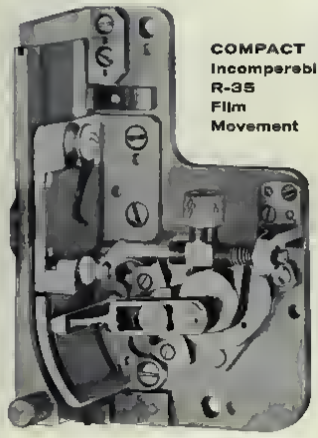
ACTOR JAMES MASON attacks the "violence camera" with his sword for a closeup shot for "The Land We Love." Operator Dick Batcheller, using hand-held Arriflex 35 camera, is protected from the violent sword slashes by shield. Story of the picture's complete photography appears in this issue

AMERICAN CINEMATOGRAPHER, established 1920, is published monthly by the A S C Agency, Inc., 1782 N Orange Dr., Hollywood 28 Calif. SUBSCRIPTION: United States and Canada, $4.00 per year. Foreign including Pan-American Union $5.00 per year. Single copies 35 cents; back numbers 45 cents; foreign single copies 45 cents; back numbers 55 cents. Advertising rates on application. Copyright 1961 by A. S. C. Agency, Inc. Second-class postage paid at Los Angeles, California

NEW MITCHELL R-35

...only truly professional portable reflex motion picture camera

Designed to cover the widest range of professional motion picture applications, the all new Mitchell R-35 reflex camera offers remarkable versatility to exceed the requirements of most discriminating cinematographers. Streamlined design is combined for the first time with the full range of professional features by Mitchell—world's leading source of truly professional motion picture cameras and equipment.



COMPACT Incomparable R-35 Film Movement

Designed to produce rock-steady films completely compatible with those of the well-known Mitchell BNC, NC and Standard cameras, the new R-35 dual register pin movement features Twin registration pins ... twin pull-down claws, stop-motion to 120 FP S ; removable aperture plate with built-in filter holder slot ... holds two thicknesses of gelatin filters Full size: 0 980" x 0 735", removable pressure plate, entire movement removable for cleaning ... special construction insures foolproof insertion with no loss of timing

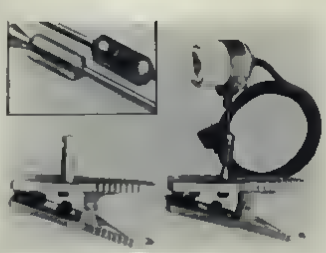
Hand Held or Tripod Mounted, the new Mitchell R-35 reflex camera uses a new series of Super Baltar matched lenses designed specifically for the R-35 by Bausch & Lomb. For Complete details of the outstanding features of this remarkable 35mm camera, write for the new R-35 Bulletin

MITCHELL R-35

MITCHELL CAMERA CORPORATION
666 W HARVARD ST GLENDALE 4 CALIF
TECHNICAL REPRESENTATIVE:
521 FIFTH AVE , NEW YORK 17 N Y

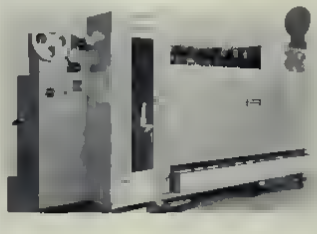
WHAT'S NEW

IN EQUIPMENT, ACCESSORIES, SERVICES



ColorTran Gaffer Grip

Constructed of cast aluminum and featuring powerful clamping jaws, the Gaffer Grip is designed to support lighting equipment in locations where it is impractical to use stands. The clamp jaws are studded with permanent rubber tips which will not mark griped surface. Model GAG has a ⅝" stud, will suport largest ColorTran lights, baby kegs, or flags. Price is $6.90. Model GBG features a spring-loaded ball-joint swivel mount (pictured) and is priced at $8.90. Other models are available with either medium or mogul porcelain sockets. Natural Lighting Corp., 630 So. Flower St., Burbank, Calif.



16mm Reversal Film Processor

A new 16mm reversal film processor that develops 16mm film at 2,160 ft. per hour is announced by Filmline Corp., Milford, Conn. Among salient features of the model R-36 are: overdrive film transport, controlled processing, daylight operation, temperature control system, variable speed drive, two developer pumps, built-in air compressor, bottom drain valves and drain trough, and stainless steel construction. The equipment can also be operated at 83°F at better than 60 feet per minute. Detailed literature is available from Filmline Corporation.

Sonocolor Sound Striper

The Sonocolor Model SCF2 magnetic sound striping machines are designed to apply magnetic striping to moving picture films of all sizes at rates of 1800 to 3000 feet per hour. Changeover time from one width film to another is simply done and requires about 5 minutes time. Machine will apply full coating, single or double multiple in one operation. Uniform thickness and quality of track is assured through micrometer adjustment devices. Unit requires less than 11 square feet of floor space and but a single operator. List price is $8,995, F.O.B. New York Distributor is S.O.S. Photo-Cine Optics, Inc., 602 West 52nd St., New York 19, N. Y. and 6331 Hollywood Blvd., Hollywood 28, California.

Mobile Power Unit

The CARon generator, which can be readily installed on any motor vehicle engine and driven therefrom, supplies high amperage 110-volt, 60 cycle power for camera motors, recorders and lighting equipment. About the size of an automobile generator, the CARon is driven by a belt from the car's water pump, crankshaft, or generator pulleys. A dash-mounted panel supplied with the unit contains on-off switch, voltmeter, and throttle regulator. When switch is in "off" position, the CARon produces no drag on the car engine.

Continued on Page 578

Production HEADACHES?

Turn them over to JACK A. FROST

Pioneer in Complete Production Rental Service!

Every **PRODUCTION RENTAL NEED**

- **LIGHTING — ARCS, INCANDESCENT**
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WHAT'S NEW

Continued from Page 576

Generator is available in two models: A for 12 or 24 volt systems and providing 30 amps, and Model B for 6 or 12 volt systems and having a capacity of 22 amps. Distributor is Gordon Enterprises, 5362 No Cahuenga Blvd., North Hollywood, Calif.

New Spotlight

The Molenser is a new spotlight by Mole-Richardson Co. that features a 3-lens system: 2 stationary and 1 focusing. It uses standard 1000 w or 2000 w motion picture globes and utilizes an iris and/or matt to controll spot size. Net weight is 43 lbs; length 39 inches. List price of basic unit is $325.00. Accessories are extra. Data sheet is available by writing the company at 937 No. Sycamore, Hollywood 38, Calif.

Animation Rentals

Florman & Babb, Inc., 68 West 45th St., New York 36, N. Y., offers completely-equipped air-conditioned animation studios in New York on a daily, weekly, or monthly rental basis Stands include a 1-to-40 field Portman with double rotary compound floating unit, multiplane table, automatic electric zoom focusing, etc.

Distributor Appointed

Movie Supply of Hawaii, Ltd., in Honolulu, has been appointed distributor for Hunt photographic and graphic arts chemicals in the state of Hawaii.

Correction:

The price of the Magna-Tech transistorized playback synchronizer announced in this column last month was incorrect. The correct price is $1,920, not $1,290 as printed here. ■

AURICON PRO-600 SPECIAL
400 FT., RUNS 11 MIN.
$1295 UP

EVEN THE ON-OFF BUTTON IS MUTED

--one of many reasons an Auricon 16mm Pro-600 Special gives you perfect sound without a heavy, expensive blimp

Silent operation is built into the Pro-600 Special. As a result, you can get high-quality sound even under difficult acoustic conditions without a blimp. You save as much as 75 pounds and $1800!

A superb photographic instrument, the Pro-600 Special gives you a rock-steady picture with perfect frame-line registration. Takes a 400- or 600-foot magazine; records either optical or "Filmagnetic" single system sound, as well as double-system sound.

You can carry twice the weight and pay three times the price, but you can't get better 16mm sound-on-film pictures than you get with an Auricon. Investigate the Auricon Pro-600 Special now.

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All Auricon Equipment is sold with a 30 day money back Guarantee and a one year Service Warranty. You must be satisfied!

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MANUFACTURERS OF SOUND-ON-FILM RECORDING EQUIPMENT SINCE 1931

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AURICON PRO-600 $1456.25 & up
SUPER 1200 $4149.00 & up
TRIPOD $406.25 & up
PORTABLE POWER SUPPLY UNIT $269.50
SOUND RECORDER $3643.00 & up

Q & A

Technical Questions and Answers

Q.—*I am interested in the potentialities of 8mm sound films to replace 16mm in our employee and sales training programs. Because much of the picture material will consist of close-ups of intricate mechanisms, it is essential that we get maximum picture quality and definition in the projection. Using an 8mm projector with a light output of approximately 100 lumens, what type screen would give us best results?* M. J. McB, Akron, Ohio.

A.—Eastman Kodak Company has recently issued a comprehensive bulletin on this subject titled "What Can You Do With 100 Lumens?" to answer the questions of those contemplating using E-K's 8mm sound film projector, which has a rated light output of 100 lumens. Copies are free for the asking and we recommend you send for one.

In the meantime, the following information quoted from the bulletin, regarding three types of screens, may be helpful:

Beaded screens: Have a high-reflectance pigmented finish in which a large number of small glass beads are imbedded. These tend to reflect light back in the direction from which it came. When audience can be confined within a viewing angle of 20° to each side of projection axis, the reflection characteristics of this screen may provide advantages.

Metallic Lenticular Screen: These are smooth, metallic-coated, and have a very high gain for observers seated near the projection axis, but this falls off very rapidly beyond the view-angle of 10°.

Non-metallic Lenticular Screen: The basic material is a fabric sprayed with a pearly enamel or lacquer. When this is embossed to a lenticular surface, the resulting screen has an almost uniform gain of 1.8 to 2.0, out to a viewing angle of 30° to each side. The verticle angle is similar to that of the metallic screen described earlier.

Q.—*Walt Disney's success with 16-mm color footage blown up to 35mm has encouraged me to try this technique on a short subject on the Mayan man, which I plan to shoot in Central America with the expectation of marketing the picture for theatre release.*

However, in the past, articles appearing in American Cinematographer *have not been kind to this 16mm-to-35mm process.* H. E., Jr., East Aurora.

A.—We are not aware that we have not been kind to the 16mm-to-35mm process. We have frequently stated that blowups from 16mm to 35mm are not always successful; but this depends first on the quality of the photography and second, on the laboratory making the blowups.

Walt Disney has had marked success with 16-to-35 color blowups, which are produced by Technicolor laboratories.

Continued on Page 582


AUDIO-VISUAL FILM:
GENERAL
FILM LABORATORIES

QUESTIONS & ANSWERS

Continued from Page 580

in Hollywood. The same Technicolor service is available to others, also—individuals as well as studios.

Q.—*When shooting automobiles in a day-for-night sequence, should the headlamps be replaced with a brighter unit?*—L. McM., New York, N. Y.

A.—Assuming that you will underexpose the scene slightly as a means of obtaining the "night" effect, replacing the bulbs in the headlamps with more powerful ones will enable the light to punch through the under exposure. Where the automobile or automobiles are to be photographed at close range, however, the light coming from the regular headlamps will register quite satisfactorily.

Q.—*How are rows of dancing biscuits, flying boxes, walking dolls, etc., as seen in many TV commercials, animated? Judging by the arrangement of the backgrounds in these commercials, the shots were taken from the horizontal position of the camera and no support for the moving objects is seen. I have a 16mm Bolex and would like to achieve similar results, using the single-frame exposure system.*—E. K., Toronto, Canada

A.—Animated TV commercials are usually produced with versatile and costly equipment. To describe here how all the effects you mention are accomplished would take more space than is available. There are two excellent books available on the subject: "Basic Titling and Animation," for advanced amateurs and semi-professionals, published by Eastman Kodak Co., Rochester, N. Y., and "Animation Art in The Commercial Film," by Eli L. Levitan and published by Reinhold Publishing Corp., 430 Park Avenue, New York 22, N. Y. The latter is for students and professionals and is priced at $6.95. The E-K book is 75¢ a copy.

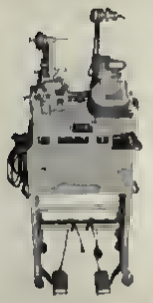
Need professional advice on a picture making problem? Readers' questions will be answered by mail when accompanied by stamped envelope for reply. Questions and answers considered of interest to readers will be published here.

PUZZLED ABOUT EDITING MULTIPLE SOUND TRACKS?

IF SO THEN TRY THE **NEW**

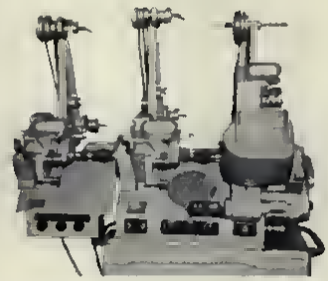
CAMART ADD-A-UNIT EXTENSION PLATE

From this



For Series 20 Moviola — U S Pat Pending

to this



HERE'S HOW IT WORKS!

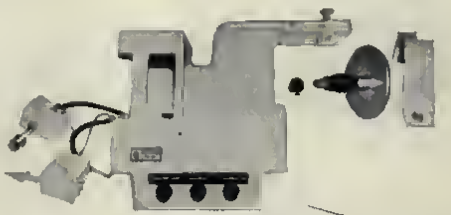
Attaches easily in a few minutes, without drilling or tapping holes. No tools required to install

NOT A PERMANENT INSTALLATION

It can be removed simply and quickly and mounted on another Moviola. With the Add-A-Unit you can edit and cut three or more sound tracks simultaneously—no need to re-run thru the entire picture.

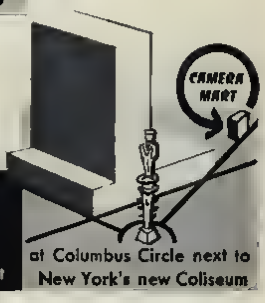
HERE'S WHAT YOU GET:

1. The Add-A-Unit extension plate ribbed construction of durable aluminum alloy, precision machined to fit any series 20 Moviola film editing machine in perfect alignment.
2. Extra belt guards and screws.
3. Complete flexible coupling assembly to interlock sound heads.
4. Extra flange
5. Amplifier connections with all ready made fittings for easy installation.
6. Separate volume controls permit individual control over each sound head, including the composite



Camart Add-A-Unit Extension Plate **$259.50** **COMPLETE**

Additional Separate Sound heads with take ups—Prices on Request



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1845 BROADWAY (at 60th St.) NEW YORK 23 • PLaza 7-6977 • Cable Cameramart

at Columbus Circle next to New York's new Coliseum

INDUSTRY NEWS

NEWS BRIEFS OF THE HOLLYWOOD FILM INDUSTRY

Joseph Ruttenberg Honored

Joseph Ruttenberg, ASC, a Director of Photography at Metro-Goldwyn-Mayer Studios, has been elevated to Fellow Membership status in the Society of Motion Picture and Television Engineers Seventeen other SMPTE members were similarly honored

JOS RUTTENBERG

Mr. Ruttenberg started his photographic career in 1908 and since that time he has received four Oscars from the Academy of Motion Picture Arts and Sciences for outstanding photographic achievements

* * *

CECO Acquired by Dynex

Dynex Industries, Inc., makers of photographic equipment, have announced the acquisition of Camera Equipment Co., New York City. Board chairman of the combined company is Robert B Bregman of M L Bregman & Co., Wall Street financial house.

* * *

Dynatoon

A new process named Dynatoon that converts photographed live action to animation has been developed and patented by Norman Maurer, former cartoonist of comic books who recently produced "The Three Stooges Meets Hercules" for Columbia pictures.

* * *

Bolex Film Competition

The deadline for entries in the Bolex Movie Contest has been extended to December 31. Unlike other 16mm film contests, the Bolex competition is for amateur and professionally produced one-minute TV commercials in black-and-White or color According to Paillard, Inc., U. S. distributor of Bolex cameras, the commercials must tell the Bolex story by using Bolex 8mm or 16mm equipment, or some of their features, as subject matter in the film.

Prizes include a Bolex H-16 Rex camera fully-equipped, Pan Cinor 85 zoom lens, 16mm Bolex titler, and three Bolex 8mm two-speed projectors.

Continued on Page 588

Super Values In Focus at HOLLYCAM

Exceptional values in productive motion picture equipment that professional cinematographers all over the world acclaim! The world's largest inventory, Professional service, at the lowest possible prices . . . that's HollyCam

Mitchell

MOVIOLA

Model D 35mm

SAVE MORE THAN $200.00

Features a large 3 inch diameter viewing lens Variable, foot controlled variable speed motor Can also be hand braked at winding Prism Film can remain stopped as long as desired Includes take up and supply spindles Comes with case and foot switch Takes 10 inch (1000 ft) reels 100-120 volt 25-60 cycle

SPECIAL PRICE **$189.50**

Model UDS 35mm picture head with optical sound 3" viewing lens Stand motor and reels Indias $585.00

Model UDS Mag—Same as UDS with magnetic sound pick up $695.00

Model UD2S—Same as UDS but with 2 sound heads $758.00

Model UD4S—Same as UDS but with [illegible] $885.00

35mm Projector Has projection head with composite 35mm optical sound Separate head for 35mm optical mag or ¼" tape

An unusual buy at $795.00

HOUSTON FILM PROCESSORS

Model K 2—16mm Negative and Positive	$ 695 00
Pump and Compressor for Model K 2	150 00
Model K-1A—16mm Neg/Pos Reversal	1995 00
Model K-3—16mm Neg/Pos Reversal	2450 00
Model K 3A—16mm Neg/Pos Reversal	2850 00
Model A-11—16/35mm, Neg/Pos Reversal	2895 00
Labmaster—16/35mm, Negative, Positive	3250 00

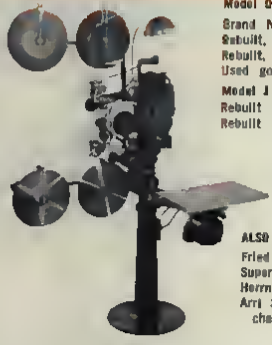
16MM AMPRO ARC SOUND PROJECTOR

30 amp hi intensity arc, auto carbon feed [illegible] amplifier and 12" speaker Top quality 2" proj lens Heavy duty stand and cables HollyCam Special

$795.00

Other Arc Sound Projectors also available

BELL & HOWELL PRINTERS



Model Q Printers—35mm

Brand New	$3100 00
Rebuilt, like new	2800 00
Rebuilt, very good	2360.00
Used good	2100.00

Model J Printers—16mm

Rebuilt like new	$3250 00
Rebuilt very good	3100 00

(All above printers with original style lamphouse.)

For HI INTENSITY LAMPHOUSE add $450 00

Rectifiers $335 00

ALSO AVAILABLE:

Fried 16mm Cine Printer	$ 995.00
Superior 16mm Printer	80.50
Herrnfeld 35mm Printer	1280.00
Arri 35mm Printer w/light changer	1475 00

BELL & HOWELL 35MM EYEMO "Q"

Complete outfit 8 to 48 fps. Outfit includes camera w/spider turret & open back 1", 2" and 6" B&H lenses w/filters and sunshades, new Eyemo motor power cable, two 400' mags drive belt and drum finder

LIST VALUE OVER $2000!

ALL THIS FOR **$495.00**

GRISWOLD 35MM FILM SPLICER

A Neumade product For fast, accurate splicing on frame line with accurate hole spacing No adjustments required

Model R 2, List $32 00 USED **$12.95**

Model T, w/light, List $45 00 NEW **$21.50**

16MM COLOR FILM SPECIAL

EASTMAN KODAK TYPE 7253

Color Intermediate for use as Interpositive and Internegative when making 16mm color prints from 35mm Type 5250 master negatives Slightly outdated but sold on a fully guaranteed basis 190,000 feet in 1200 ft rolls in stock

List price per 1200-ft roll is $90 00 Our Price $39.50

KODACHROME

16mm x 100 ft daylight or Type A	$ 4 80
16mm x 200 ft Type A including processing	13 95
16mm x 400 ft Type A including processing	24 95

SCENE SLATES

Brand New Made by Radiant Mfg Co Scene Camera and take numbers are on sturdy flip cards Heavy duty metal bound

ONLY **$3.95**

A $12 00 value

H C Hollywood Camera Co.

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All prices f o b our plant Equipment not listed as new or reconditioned is used Check with order please or 25% deposit, balance on delivery Purchase orders welcomed from D&B rated firms

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S.O.S. SPECIALS OF THE MONTH

NEW...USED...REBUILT...SURPLUS. . . *Take Advantage of These Tremendo*

Price Reductions!! Write, Wire or Phone Before it is Too Late!!

★ CAMERAS, 35MM

ARRIFLEX I, 3 Geerz Apogar Lenses, 200′ magazine, motor $495 00
MITCHELL SINGLE SYSTEM. 4 Baltar lenses, 3 1000′ magazines; viewfinder; matteboy; 12V motor; Medu lite galvanometer. Originally $9000 ..... $3950 00
EYEMO 71P, 2-400′ mags 110V AC/DC motor 3 Cooke Speed Panchro lenses 2 cases $595 00
DEVRY Magic Eyes 010° variable shutter; 2″ lens $149 50

★ CAMERAS, 16MM

AURICON SUPER 1200 Zoomdeal VD galve NR35D7 Amplifier, 2 1200′ mags TVT shutter, Cases $6100 when new $3995 00
CINE SPECIAL 4 lens turret PAR 400′ mag, fillet slots fade attachment 3 Tenses—Angenieux 10mm fl 9 Ekter 25mm fl 4 Century 6″ Athenar, all accessories $2800 value $1795 00
BOLEX converted 400′ mag , rackover, telescopic finder 110/24v motor Close out good as is $295 00
CINE SPECIAL II Camera, 3 Ekter Lenses; 100′ Chamber $695 00
B & H 70 DA Filme w/single frame; Iris vignetter, finder; 110V AC/DC motor; 7 fine lenses, positive finder; 5 objectives filters $700 value, likenu $395 00
MAURER 05; Syncmotor; 400′ magazine; viewfinder 3 lens turret Originally $5500 ..... $1495 00
B&H FILMO Tu ret Automaster Autoload fl 9 lens case Originally $350 ..... $279 50
AURICON SUPER 1200′ porollax finder variable shutter 2 400′ mags., case Less galve $5300 list $2495.00
CINEPHONIC, Magnetic recording, 400′ Mitchell mag 3 Elgeet lenses turret transistor amplifier power supply, mike Pre Jr. tripod and triangle Originally $3900, likenu $1495 00

★ CAMERA ACCESSORIES

RASY SLIMP for Mitchell NC Iellow locus gears, $1500 value $995 00
HOUSTON FEARLESS TC-1 Television Camera Crane Factory price $5800, likenu $3495 00
SCANOPTIC ANAMORPHIC System includes basic Cinema Scope type lens; 4 f2 3 Baltar camera lenses—40/50/75/100mm for Mitchell N C $9000 value. ..$3300 00
CINE VOICE Portable Power Supply, nickel cad battery, charger, $195 value $125 00
ARRIFLEX Voltalloc Powerpack, used With built in charger $110 Less charger $99.50
B&H 400′ bipack magazine $149.50
PHOTO RESEARCH Spectra Meters with filters, sphere, case 2 Color $129.50
NATIONAL CINE Crab Dolly, very good condition $4750 original cost $3500 00
RAISY heavy studio dolly $695 00
MOTORIZED DOLLY w/revolving head 7′ boom height, 2 seats; hihat, brackets for 6 lites $4000 originally $695 00
AKELEY Gyro Tripod, $1100 originally $595 00
EYEMO 6V Motors, B/48 fps Nme $74.50
CECO CINE Special Blimp, syncmotor $395 00

★ LABORATORY EQUIPMENT

NEW B & H 35mm Main Sprockets for D printers $500 value $295 00
ART REFVES SENSITESTER, 16/35 combined sens/densitometer likenu $795 00
EASTMAN EDGE NUMBERING machine with nme number ing block $1 445 00
DUPONT 35mm EDGE NUMBERING Machine, complete $1295 00
PHOTOVOLT Densitometer 16/35mm with soundtrack accessory Cost $750 when new $395 00
PAKO Heat Exchangers controls solution temperatures accurately $300 value Nme (Surplus) $98 50
FRIED Light Scope Tester 7 to 11 exposures As Is $99 50
EASTMAN Electric 35mm Film Waxing Machine with heating element and motor Originally $1500 Rebuilt $495 00

★ ANIMATION & SPECIAL EFFECTS

PATHE 35mm FILMSTRIP Camera; B & L Lens; 4 200′ magazines; single frame forward and reverse synchronizer, frame counter; push button switch Reconditioned $695 00
TEL ANIMAPRINT Hot Press, Electronic Control new demonstrator $459 50
CINE SPECIAL ANIMATION Motor, Nme $299 50
ACME 7″ Animation stand, E/W/N/S movements sliding pegs B&H 35mm camera, Acme stepmotion motor $12 500 value $3795 00
TEL ANIMASTAND, art table N/S/E/W, rotary movement Nme demonstrator $3000 value $1495 00
B&H 35mm Animation Cameras; 400′ magazine, dissolve $3500 original cost $1250 00
SAME with thru lens focusing $1750 00

★ MOTION PICTURE PRINTERS

B & H 16mm Model JC Printer reconditioned ..$3995 00
RCA REDUCTION PRINTER 35/16mm soundtrack 180′ per minute $9000 value, excellent $3500 00
CUSTOM BUILT 35mm Step Printer, pilot pin registration $395 00
DEPUE PRINTER 35mm DUAL SOUND & PICTURE Prints from two negatives $1295 00
TEL-AMATIC 16mm SOUND & Picture Printer Semi automatic light change $995 00
B&H Printer, 35mm step contact, pilot pin spreaders, semi automatic light change Original cost $4000 ..... $995 00
CINECOLOR Double Head 35mm Step Printer with automatic lite change and timing device Originally $12,000 (Bank foreclosure) $2495 00

★ LIGHTING EQUIPMENT

KLIEGL FLUORESCENT Fixtures w/separate ballast pantograph hanger Take 6 slimlien 64″ lamps $397 list, excellent $99.50
LARGE SILVER REFLECTORS hardwood hinged frames with pronged support
4 ft x 4 ft, double surface $37 50
4 ft x 6 ft single surface $42 50
DOUBLE BROADS with stands 1000W lamps $59 50
10 000W Fresnel Spot heads cost over $500 ..... $249 50
BARDWELL McALISTER 750W Baby Keglite heads..$39 95
BARDWELL McALISTER 2000W Spots, likenu $89 95
MOLE RICHARDSON 2000W Spots, black #412 ..$79 95
MOLE RICHARDSON 5000W Spots, black #415 $149 95
MOLARC 150 amp head, grid and pedestal list price $2410 when nme $795 00

★ RECORDING EQUIPMENT

MAURER D 16mm Optical Recorder, twin track negative/positive; 4 pos mixer; noise reduction amplifier 400′ mag Excellent $3250 00
RCA 35mm OPTICAL RECORDERS 220V 3 ph synchronizers, bilateral galve 1000′ mag used as is $225 00
KINEVOX 4-position mixer, AC operated, VU meter Cost $695 ..... $225 00
STANCIL HOFFMAN Model S-6 Sync 17 5mm Mag Recorder & Reproducer, P24C Power Supply, playback amplifier cases Originally $2800 ..... $895 00
STANCIL HOFFMAN S-5 edge or center 16mm track Originally $2000 Complete $995 00
AURICON RT80 16mm Optical Recorder, VA Amplifier NR22 cases Originally $1100 ..... $395 00
RCA PHOTOPHONE 35mm Fantasound film phonograph with Selsyn motors Orig $6 500 ..... $695 00

★ PROJECTORS, BACKGROUND, PREVIEW

TSC BACKGROUND slide Projector, 4000W, $1000 orig $395 00
FILMCRAFT 35mm Movie Background Process Outfit Write for details $15 000 value Bank foreclosure .$1 995 00
HOLMES 16mm ARC PROJECTOR; Streng babyarc; 15A rectifier pedestal less amplifier $295 00
SIMPLEX Acme 35mm Arc Sound Projector with pedestal $2
PREVIEW Interlock Projector, DeVry, 1000W lamp, picture and sound simultaneously ..... $

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MOVIOLA PREVIEW 35mm UDPVS separate picture soundhead, on rolling stand 4″x6″ rebuilt $1
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MOVIOLA 35mm UDS separate picture and sound on rolling stand ..... $
MOVIOLA 35mm UDCS ,separate sound and camera picture/magnetic optical footage counter. On stand Excellent $2
MOVIOLA 16mm ULC bullseye composite picture sound, rolling stand $9
ACMIOLA 35mm Viewers w/stands, 6″x8½″ motorized $1 500 original cost $2
AKELEY 35mm Viewer, sound and composite S erectial Image Original cost $3000 closeout ..

★ FILM PROCESSING EQUIPME

GPL 401 HI SPEED 16 mm Spray Processor, Reconditioned Originally $8000 ..... $3
HOUSTON 16mm PROCESSOR A II will handle 35m changing rollers Dailie loading, neg/pos/reversal control incomplete otherwise appears good $2
FILMLINE 16mm RACETRACK REVERSAL Processor dles 200′ of film dry to-dry in 3½ minutes Oi cost $5450 Our special price $2
HOUSTON FEARLESS 228 neg /pos processor; tem ture control; recirculation; 1800′ per hr As Is $1
MAMMOTH HOUSTON Color Processor, 16/35mm, A Ektachrome, neg /pos , up to 1200′ per hr , 16 less steel tanks one fiberglass lined Full ½″ perature control Recirculation, air supply, 7 s gees Cost Cuban government $35,000 Rebuilt new $11

★ CUTTING ROOM SUPPLIES

B&H FOOT SPLICERS, excellent condition 35mm ..$5
70mm ..
FOSTER AUTOMATIC REWIND on table w/ins lite, 110V AC 60 cy hvy duty motor, foot control, speeds zero to 875 RPM ..
CRAIG 16mm Editor Viewers, excellent ..

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200 Amp GENERATOR, 110DC, water cooled en on 4 wheel trailer $2500 value. ..... $
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INTERLOCK DISTRIBUTOR primary 110V 1ph seco 220V 3ph for recording studios $4
Control cabinet with absolute 24 frame ner $4
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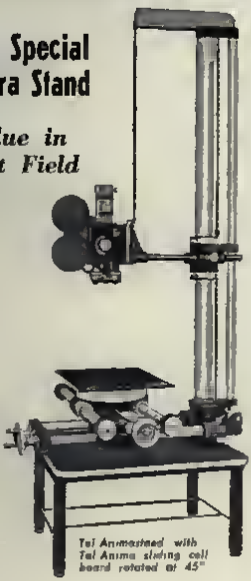

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The Sensational TRANSIST-O-SOUND HIGH FIDELITY LIGHTWEIGHT AMPLIFIER

Now at S.O.S.

This unit is now in some 25 TV stations coast to coast in daily newsfilm work. Letters on file tell of the added portability, permitting sound on film newsfilm where previously only silent coverage was possible.

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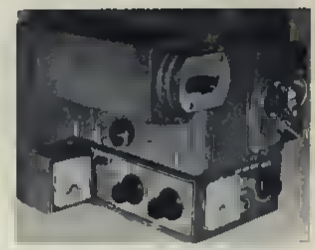
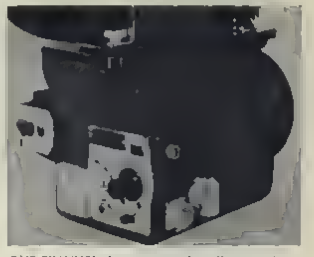


TWO CHANNEL self contained unit. Illuminated VU meter for night work. Wt 31/2 lbs . . $335



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INDUSTRY NEWS

Continued from Page 584

Clarke Teaching Cinematography at U.C.L.A.

Charles G. Clarke, ASC, one of 20th Century-Fox's veteran Directors of Photography, is teaching advanced cinematography at the University of California at Los Angeles two evenings a week. Clarke lectures on Wednesday evenings and teaches techniques through practical demonstrations on Thursdays. The October 5th session will be conducted at 20th Century-Fox studios, where students will visit and witness practical operations of the studio's camera and special effects departments. Clarke's sessions are scheduled to embrace two semesters

CHAS. G. CLARKE

• • •

One-take Close-long Shot

The closest closeup and the longest long-shot ever made in one continuous take is said to have been filmed last month by cinematographer Freddy Young for "Lawrence of Arabia," on location in Jordan. The unique shot was made with the camera mounted on an air-borne helicopter and using latest Panavision lens equipment

Starting with a tight closeup of the star, Peter O'Toole, the copter then zoomed syward for 2500 feet, thus enabling the lens to embrace the full scope of the desert terrain of the location

• • •

Closeups: The new motion picture processing plant begun last month by *Capital Film Laboratories*, Washington, D.C., will embrace 27,000 square feet of floor space, be ready January 1st, according to Capital's Prexy James A. Barker . . *Florman & Babb, Inc.*, New York City, has added 5,000 feet additional floor space to their establishment through acquisition of a one-story building at 304 West 54th St. New unit will house company's Rental and Service departments . . . D. J. White, president of *Magnasync Corp.*, No. Hollywood, announces company has been awarded contract for 300 of its Model T-1510 tape recording systems and 141 reproducers . . *Houston Fearless Corporation's* Westwood Division, Los Angeles, has received an Air Force contract for the design and manufacture of an electronically controlled random access photographic storage and retrieval system. ■

HE CHOSE BOLEX A MILLION MILES AGO

(and enjoyed handling ease, versatility and precision every step of the way)

When photographer George Perkins II accepted a south-of-the-border travelogue filming assignment 11 years ago, he marked down two camera requirements: High quality, light weight. He then selected the 16mm Bolex.

The result of that trip was a feature length color film of Mexico, the Yucatán Peninsula and Guatemala of such quality that it is still in demand in lecture halls.

Now at the million-mile mark in his camera travels, Perkins, an associate of the Burton Holmes Travelogues Company of Hollywood, has looked through the lens of his Bolex at memorable scenes in 22 countries around the world. "The feeling of real pleasure I had when I first took my 16mm Bolex from its case that day in Mexico has only been multiplied in the years since," Perkins says.

"The way it handles, the ease with which it can be hand-held, the versatility of its three-lens turret . . . Superb through-the-lens viewing and focusing and the new variable shutter and viewer that match so perfectly with so many lenses . . . All these qualities make Bolex an exceptional camera for my work in travel photography and in the industrial-commercial field." That's how a professional enthuses about *his* Bolex.

The pleasure Bolex has brought Mr. Perkins has been shared by travel film audiences in more than 200 cities in the United States and Canada. You can get in on the Bolex fun for a surprisingly low investment.

•

. . . Another example of Bolex getting the job done for the professional.

BEHIND THE CAMERAS

WHAT THE INDUSTRY'S CAMERAMEN WERE SHOOTING LAST MONTH

BY MARION HUSHINS

NOTE: Asterisks following titles indicate television film productions.

ALLIED ARTISTS

ROBERT KRASKER, "Bill Budd" (C'Scope; Anglo Allied Prod.; shooting in Spain & England) with Robert Ryan and Peter Ustinov. Peter Ustinov, producer-director.

JOE BIROC, ASC, "Hitler" (Three Crown Prod.) with Richard Basehart and Mario Emo. Stuart Heisler, director.

CARL GUTHRIE, ASC, "The George Raft Story" with Ray Danton and Jayne Mansfield. Joe Newman, director.

COLUMBIA STUDIOS

FRED GATELY, ASC, "Hazel"*.

JACK MARTA, "Route 66"*.

BURNETT GUFFEY, ASC, Commercials*.

PHILIP LATHROP, ASC, "Experiment in Terror" (Geoffrey-Kate prod.; shooting in San Francisco) with Glenn Ford and Lee Remick. Blake Edwards, producer-director.

HARRY STRADLING, ASC, "Five Finger Exercise" (Somnis Corp.) with Rosalind Russell and Jack Hawkins. Daniel Mann, director.

BOO HUKE, "Reach for Glory" (John Kohn-Jud Kinberg Prod.; shooting in England) with Harry Andrews and Kay Walsh.

ARTHUR GRANT, "The Pirates of Blood River" (Megascope & Eastman Color, Hammer Film Prods.; shooting in England) with Kerwin Mathews and Glenn Corbett. John Gilling, director.

PHILIP TANNURA, ASC, "Shannon"*.

IRVING LIPPMAN, Commercials*.

FRED YOUNG, "Lawrence of Arabia" (Super Panavision 70 & Technicolor; Horizon-American Prods.; shooting in Jordan) with Peter O'Toole. David Lean, director.

GERT ANDERSEN, ASC, "Donna Reed Show"*.

ALDO TONTI, "Barabas" (Technirama 70 & Technicolor; Dino De Laurentis Prods.; shooting in Italy) with Anthony Quinn and Silvano Mangano. Richard Fleischer, director.

ARTHUR ARLING, ASC, "Notorious Landlady" (Kahlmar-Quine Prod.) with Kim Novak and Jack Lemmon. Richard Quine, director.

CHRIS CHALLIS, "The Mutineers" (C'Scope & Color; G. W. Films, Ltd., shooting in Spain) with Alec Guinness and Dirk Bogarde. Lewis Gilbert, director.

GIUSEPPE AQUARI, "Conga Vivo (Dino de Laurentiis Prods., shooting in the Congo) with Jean Seberg and Gabriele Ferzetti. Giuseppe Berardi, director.

DESILU—Cahuenga Studios

ROBERT DE GRASSE, ASC, "Dick VanDyke Show"*, "Danny Thomas Show"*.

STO HICKOX, ASC, "The Andy Griffith Show"*.

HENRY CRONJAGER, "Joey Bishop Show"*.

NICK MUSURACA, ASC, "The Jack Benny Show"*.

DESILU—Culver City

CHARLES STRAUMER, "The Untouchables"*.

LOTHROP WORTH, ASC, "The Real McCoys"*.

DESILU—Gower Studios

WILLIAM SKALL, ASC, "Robert Young Show"*.

CHARLES VAN ENGER, ASC, "Lassie"*.

TED VOIGHTLANDER, "Ben Casey"*.

ROBERT PLANCK, ASC, "My Three Sons"*.

EDWARD FITZGERALD, ASC, "Straightaway"*.

FOX WESTERN AVENUE

JAMES VAN TREES, ASC, "Dobbie Gillis"*.

ROBERT HAUSER, "Bus Stop"*.

RICHARD RAWLINGS, "Margie"*.

FILMWAYS STUDIOS—New York

MORRIS HARTZBAND, "The Defenders"* (CBS) Boris Sagal and Buzz Kulick, directors.

GENERAL SERVICE STUDIOS

THOMAS TUTWILER, ASC, "International Golf Show"*.

ROBERT MORENO, "Adventures of Ozzie & Harriet"*.

ROBERT HAGER, "Perry Mason"*.

ARCH DALZELL, "Mister Ed"*.

HARRY WOLF, "Hennessey"*.

INDEPENDENT

DANIEL FAPP, ASC, "One, Two, Three" (P'Vision; Pyramid Prod.; A. G. Mirisch Co. for UA; shooting in Berlin) with James Cagney and Horst Bucholz. Billy Wilder, producer-director.

EMMANUEL ROJAS, "Out of the Tiger's Mouth" (Shooting in Hong Kong, Ruggles-Whelan Enterprises for Sutton Prods.) with Han Yi. Tam Whelan, Jr., director.

LEO TOVER, ASC, "What a Wonderful Life" (Mirisch-UA, shooting in Florida) with Elvis Presley and Arthur O'Connell. Gordan Douglas, director.

FRED WEST, ASC, (Shooting in Nashville, Tenn.) Methodist Church Films.

FRANK PLANER, ASC, "The Children's Hour" (Wm. Wyler Prod.—Mirisch Co.; UA release) with Audrey Hepburn, Shirley MacLaine and James Garner. William Wyler, producer director.

JACK HILDYARD, "The Road to Hong Kong" (Melnor Prod.; UA release, shooting in London) with Bing Crosby, Bob Hope and Joan Collins. Norman Panama, director.

HASKELL WEXLER, "The Intruder" (Roger Carman Prod.; shooting in Mo.) with William Shatner and Frank Maxwell. Roger Corman, producer-director.

GORDON AVIL, ASC, "Wild Harvest" (Shooting in Homestead, Fla.) with Dean Fredericks and Kathleen Freeman. Jerry Baerwitz, director.

Continued on Page 594

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BEHIND THE CAMERAS

Continued from Page 591

TED MCCORD, ASC, "Smog" with Enrico Maria Salerno and Annie Giradot Franco Rossi, director.

SAM LEAVITT, ASC, "Advise and Consent" (Otto Preminger Prod., Columbia release, Panavision, shooting in Washington, D.C.) with Henry Fonda and Charles Laughton Otto Preminger, producer-director

METRO-GOLDWYN-MAYER

MILTON KRASNER, ASC, "Sweet Bird of Youth" (Pandro S. Berman Prod.) with Paul Newman and Geraldine Page Richard Brooks, director.

LUCIEN ANDRIOT, ASC, "National Velvet"*.

HARKNESS SMITH, "Dr Kildare"*.

WILLIAM SPENCER, "Cain's Hundred"*.

GEORGE CLEMENS, ASC, "Twilight Zone"*

ROBERT PITTACK, ASC, "Father of the Bride"*

ROBERT SURTEES, ASC, "Mutiny on the Bounty" (Ultra Panavision & Color, shooting in Tahiti; Arcola Prods.) with Marlon Brando and Trevor Howard. Lewis Milestone, director.

LIONEL LINDON, ASC, "All Fall Down," with Eva Marie Saint and Warren Beatty. John Frankenheimer, director.

PAUL VOGEL, ASC, "Wonderful World of The Brothers Grimm" (MGM-Cinerama; Geo. Pal Prod.) with Laurence Harvey and Karl Boehm. Henry Levin and George Pal, director.

JOSEPH LASHELLE, ASC, "How the West Was Won" (MGM-Cinerama Prod.; Metro-Color, 4th Episode) with Richard Widmark and Henry Fonda. George Marshall, director.

ROBERT BRONNER, ASC, "The Horizontal Lieutenant" (Euterpe Prod.; C'Scope & Color) with Jim Hutton and Paula Prentiss Richard Thorpe, director.

JACK SWAIN, "Rawhide"*.

DALE DEVERMAN, Commercials*

PARAMOUNT STUDIOS

ELLSWORTH FREDRICKS, ASC, "Escape From Zahrain" (P'Vision & Technicolor) with Yul Brynner and Sal Mineo Ronald Neame, director

WILLIAM CLOTHIER, "The Man Who Shot Liberty Valance" (John Ford Prods.) with James Stewart and John Wayne John Ford, director.

WILLIAM MARGULIES, ASC, "Outlaws"*

WALTER CASTLE, ASC, HASKELL BOGGS, "Bonanza"*

HAROLD LIPSTEIN, ASC, "Hell is for Heroes" with Steve McQueen and Bobby Darin. Don Siegel, director

WALLACE KELLEY, ASC, "The Errand Boy" (Jerry Lewis Prod.) with Jerry Lewis and Brian Donlevy. Jerry Lewis, director.

FRANK PHILLIPS, "Have Gun Will Travel"*.

PARAMOUNT SUNSET STUDIOS

FLEET SOUTHCOTT, "Gunsmoke"*

LESTER SHORR, ASC, "Pete and Gladys"*

REPUBLIC STUDIOS

CHARLES BURKE, "The Carruptors"*

HOWARD SCHWARTZ, "The Rifleman"*.

WILFRID CLINE, ASC, "Robert Taylor Detectives"*

GEORGE DISKANT, ASC, "Dick Powell's Zane Grey Theatre"*.

REVUE STUDIOS

RUSSELL HARLAN, ASC, "The Spiral Road" (Shooting in Dutch Guiana) with Rock Hudson and Genea Rowlands. Robert Mulligan, director

RUSSELL METTY, ASC, "Touch of Mink" (P'Vision & Color; Granley Prods.) with Cary Grant and Doris Day Delbert Mann, director

ELLIS THACKERY, ASC, JOHN WARREN, ASC, "Thriller"*.

JACK MACKENZIE, ASC, "Ichabod and Me"*, "Bachelor Father"*

NEAL BECKNER, "Bob Cummings Show"*.

RAY FLIN, "Tall Man"*

ELLIS THACKREY, ASC, "Wells Fargo"*

WALTER STRENGE, ASC, "Wagon Train"*

CLIFFORD STINE, ASC, "The Ugly American" (Universal International, shooting in Thailand) with Marlon Brando and Eiji Okada. George Englund, producer-director.

JOHN RUSSELL, ASC, "Alfred Hitchock Presents"*

BENJ KLINE, ASC, ELLIS THACKERY, ASC, "87th Precinct"*

MACK STENGLER, ASC, "Leave It to Beaver"*

ROBERT GOUGH, "Frontier Circus"*.

MAURY GERTSMAN, ASC, "Six Black Horses" (Color, shooting in Utah) with Audie Murphy and Dan Duryea Harry Keller, director.

DOUGLAS SLOCOMBE, "Freud" (shooting in Munich) with Montgomery Clift and Susannah York John Huston, producer-director.

JOHN WARREN, ASC, "The Investigators"*, "Alcoa Theatre"*

DALE DEVERMAN, WILLIAM WHITLEY, ASC, "Tall Man"*.

BENJ. KLINE, ASC, JOHN RUSSELL, ASC, "General Electric Theatre"*

TWENTIETH CENTURY-FOX

ARTHUR IBBETSON, "The Inspector" (Red Lion Films, shooting in London) with Stephen Boyd and Dolores Hart Philip Dunne, director.

OZZIE MORRIS, "Satan Never Sleeps" (Leo McCarey Prod.; shooting in England) with William Holden and Clifton Webb Leo McCarey, producer director.

KENNETH PEACH, ASC, "Follow the Sun"*

LLOYD AHERN, ASC, "Adventures in Paradise"*

WILLIAM MELLOR, ASC, "State Fair" (C'Scope & DeLuxe color, shooting in Dallas) with Pat Boone and Pamela Tiffin Jose Ferrer, director

LEON SHAMROY, ASC, "Cleopatra" (J. Mankiewicz Prod., Todd AO; shooting in Rome) with Elizabeth Taylor and Richard Burton. Joseph Mankiewicz, director.

WALT DISNEY STUDIOS

EDWARD COLEMAN, ASC, "Big Red" with Walter Pidgeon and Gilles Payant. Norman Tokar, director.

GORDON AVIL, ASC, "Wonderful World of Color"*

WILLIAM SNYDER, ASC, "Bon Voyage" (shooting in Europe) with Fred MacMurray and Jane Wyman James Neilson, director.

PAUL BEESON, "The Castaways" (shooting in London) with Maurice Chevalier and Hayley Mills. Robert Stevenson, director.

Continued on Page 625

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Leather & Vinyl case for Baby	11 50

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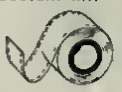

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Literature

BOOKLETS, CATALOGUES AND BROCHURES AVAILABLE FROM EQUIPMENT MANUFACTURERS

Movie Equipment Catalog

Gordon Enterprises, 5362 No. Cahuenga Blvd., North Hollywood, Calif., announces a new 100-page illustrated catalog of motion picture equipment for commercial and industrial motion pictures, television and photo instrumentation . Catolog also contains much reference material including charts, graphs and curves, plus a section showing all stock lenses and mounts available for every popular make of motion picture camera.

•

Lighting Kit Catalog

Natural Lighting Corp., 630 So. Flower St., Burbank, Calif., has just issued a new 8-page brochure on the company's ColorTran motion picture lighting kits. Brocbure illustrates and gives technical data and prices on 16 complete kits for lighting scenes or sets from 15-ft. by 20-ft. through 20-ft. by 40-ft. in size. Full specs are given for kit components such as converters, lights, stands, grips, cases, scrims, barn doors, etc.

•

Sensitometry Booklet

The Gevaert Co. of America, Inc., 321 West 54th St., New York 19, N.Y., offers a new 20-page illustrated booklet on the elementary principles and terminology of sensitometry. The booklet provides a vocabulary of definitions of the terms used in this study, gives complete technical cross section information on the technique, and charts showing the general characteristic curves of the emulsions—concluding with a chart of common logarithms. Copies are free.

•

Kodak's Reflex Special

Eastman Kodak Co., Rochester, N.Y., offers a comprehensive 10-page brochure illustrating and describing its recently introduced Kodak Reflex Special 16mm camera. Copies are free and are available from the company's Motion Picture Film Department offices in New York, Chicago, Hollywood and Rochester.

To photograph battle scenes for "The Land We Love," Ted McCord used

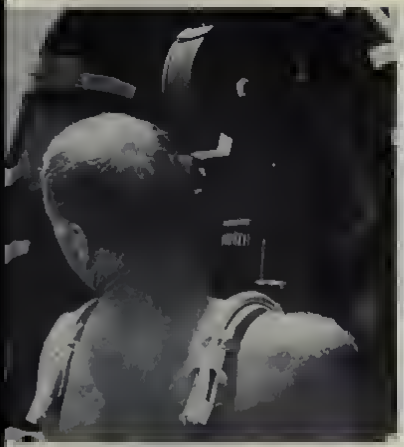
THE VIOLENCE CAMERA

THE "VIOLENCE CAMERA" is a combination protective shield and Arriflex 35 camera, shown here being strapped on camera operator Dick Batchelier.

By LESLIE STEVENS
AS TOLD TO DARRIN SCOT

"The Land We Love" is the second film produced and directed by Leslie Stevens, playwright turned motion picture producer-director-writer. His first Hollywood directorial effort was "Private Property," which subsequently established him in the front ranks of America's "New Wave" screen directors. He recently produced for 20th Century-Fox the sophisticated comedy "Marriage · Go · Round," adapted from his own Broadway stage hit.—EDITOR.

BECAUSE THERE was to be a great deal of fighting with swords in this picture, Director Leslie Stevens believed this action could be given greater impact on the screen if it were filmed in bold closeups of the men cutting and slashing with their sharp-edged weapons. To achieve this, the "violence camera" was conceived



TO GIVE REQUIRED STABILITY to the outfit, padded shoulder hooks were added

THE RIG IN ACTION—As actor James Mason foils away at imaginary adversary with his sword, operator Batcheller photographs the action

I SPEAK FROM FIRST-HAND knowledge when I maintain that a really free, strong economist (low-budget) film unit at work provides an experience that goes far beyond what the stage or television has to offer.

Film is a unity of the Seven Arts and about thirteen highly-specialized crafts—a vast fund of creative ability and energy concentrated on the realization of a particular image originating in the mind of an artist, but brought to dimensional reality through the efforts and talents of many capable and creative people. "The Land We Love" is the result of the combined efforts of such technicians and craftemen. These included Director of Photography Ted McCord, A.S.C., with whom I had worked so rewardingly earlier in the production of "Private Property." *(American Cinematographer*, August, 1960, pp. 486.—ED.)

"The Land We Love" takes place in the year 1718—a surging, dynamic time in our nation's history when people from many lands who had dared the dangers and hardships of the new world began to loose the shackles of bondage and realize America's promise of freedom and of soil they could call their own. This era was the well-spring from which flowed what was to become the national character of the United States.

Most of the picture was photographed on location in remote areas of Catalina Island, California, in terrain closely resembling that of Bull Island, off the coast of Carolina, locale of the story. The film tells a story of simple people of simple faith, standing steadfast against forces of evil and violence to cling to the land they love.

To effectively translate this story into filmic terms, a number of unusual camera techniques were used and a unique piece of equipment which we called the "violence camera" was created to photograph close-ups of sword play with unusual dramatic emphasis.

There is a great deal of fighting with swords in this picture and we felt that this action could be given greater impact on the screen if it were filmed

Continued on Page 624

REST PERIOD—Camera operator Batcheller rests on stool between takes, as Director of Photography Ted McCord discusses on upcoming take

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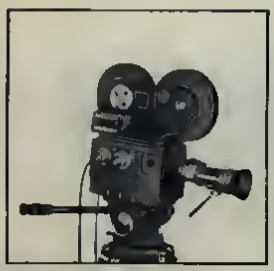

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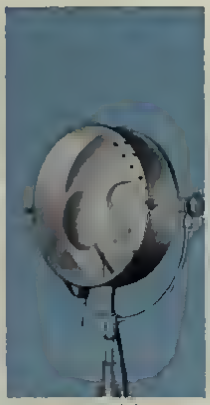

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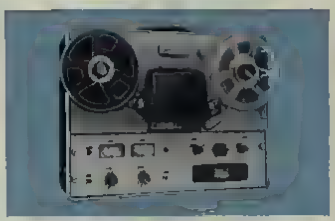

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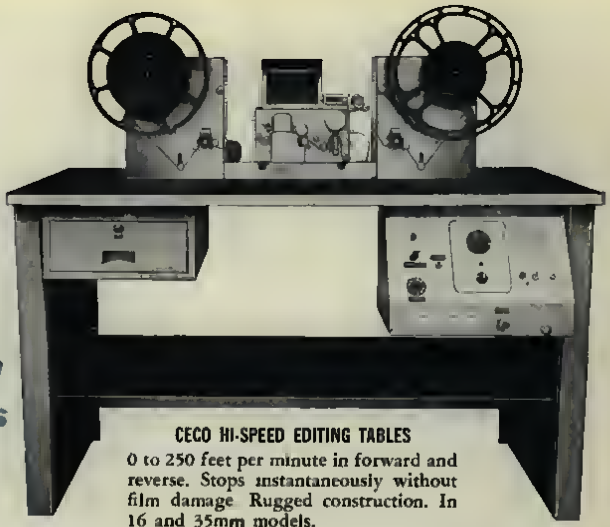

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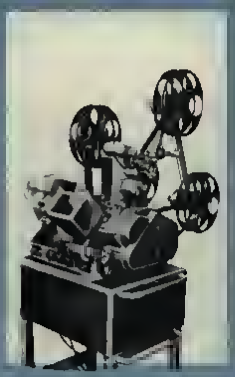

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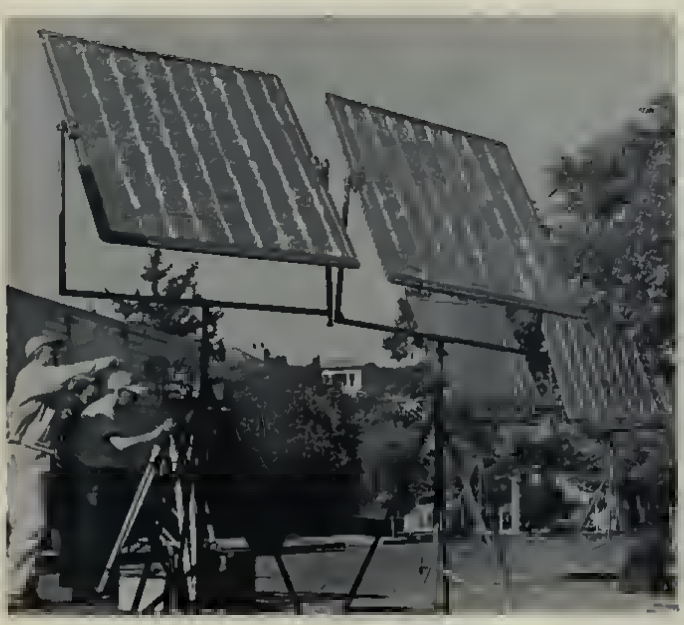


SUNLIGHT REFLECTORS are a necessity for illumination control for scenes shot outdoors. Pictured are professional reflectors having silver-leaf on the surface to reflect light into shadow areas of the scene. (Northrop Aircraft Co. photo)

Some important things to remember when . . .

SHOOTING EXTERIORS

THE PROBLEMS encountered when shooting exterior scenes out of doors (some "exteriors" are shot indoors on the sound stage) arise, paradoxically, from the rather over-abundant generosity of Nature. That is to say, the chief concern in shooting exteriors is not so much to record on film the basically necessary photographic elements — lights, subject, etc.—but to *control* those elements, which have been so lavishly placed at our disposal, in order to obtain the best possible pictorial result.

Ways and means of controlling these elements are basic, and once the cinematographer learns them, his photographic results should be consistently good. The most important single factor influencing photographic results is correct exposure. Even with present-day wide-latitude motion picture films and improvements in film processing techniques, which provide a measure of compensation for errors in exposure, the fact remains that a perfectly photographed scene results when exposure has been accurately calculated.

To achieve optimum exposure quality, the cinematographer must also consider the mechanical requirements of the scene, and the particular kind of processing which will be given his film after exposure. Where the production is a large one, it is sometimes advisable to shoot short test lengths of film on the most important exterior scenes and have your laboratory process the tests for critical examination. In this way you will learn what is the standard of development for your particular film laboratory and also

Continued on Page 627

THE SCRIM is used to diffuse direct sunlight falling on players. One shown at right is tripod-mounted and being adjusted by grip to soften light on players seated in car

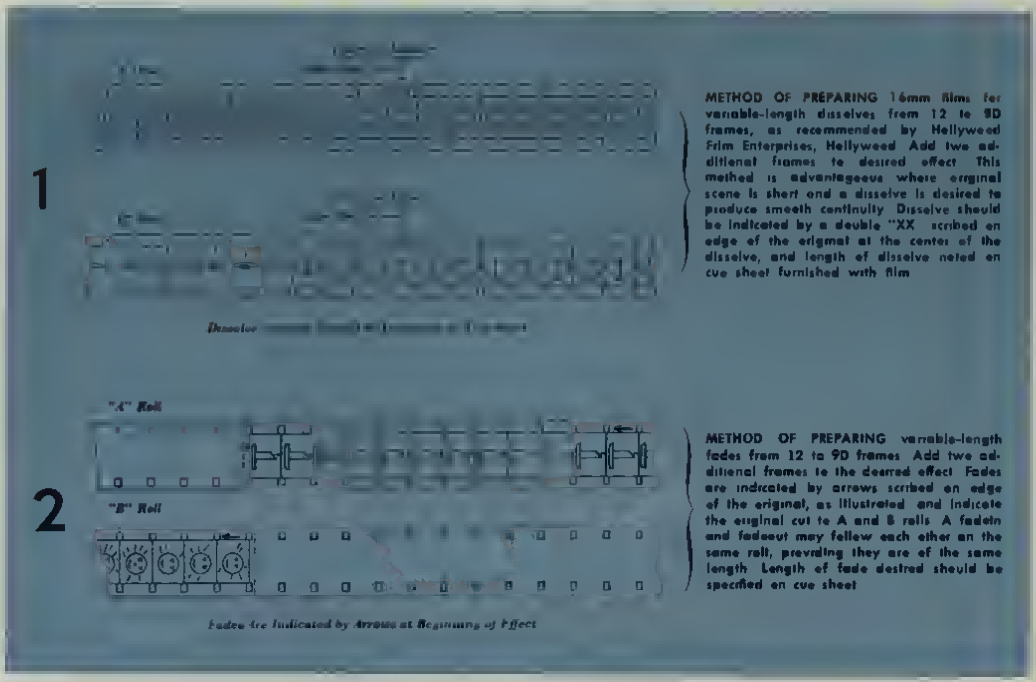
MAKING THE MOST OF LABORATORY SERVICES

Commercial labarotories from caost to coost offer many helpful services thot enable you to produce films of high professionol calibre.

COMMERCIAL FILM LABORATORIES are not only essential to the fast-growing non-theatrical film production field, but without them few motion pictures produced outside Hollywood would have the professional embellishments that have come to be associated with professionally-made pictures.

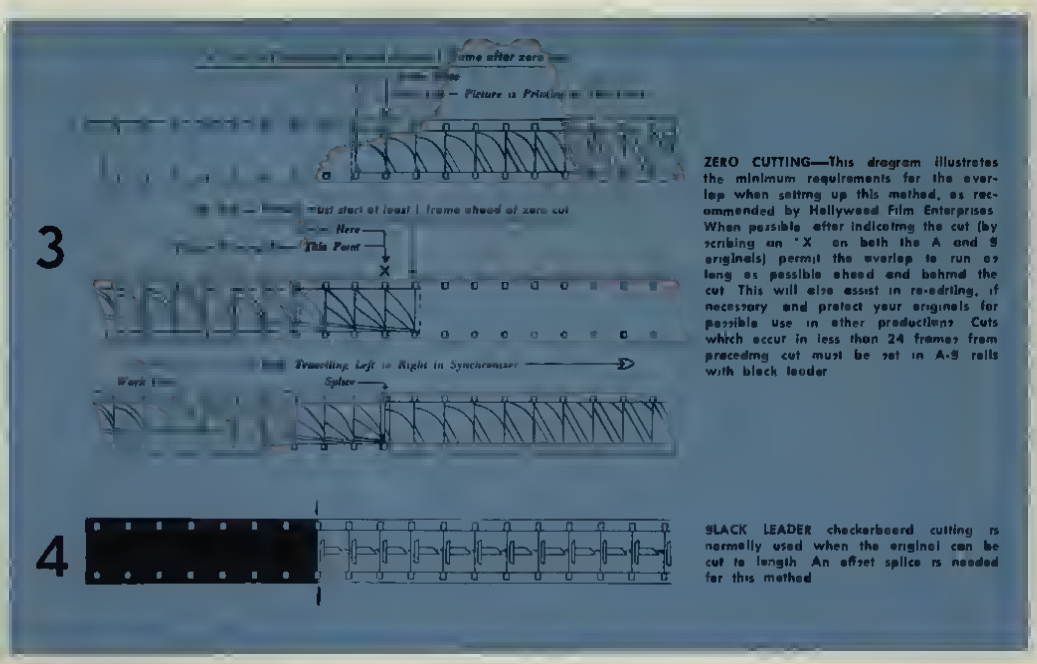
The growth of independent film production in recent years in both 16mm and 35mm has seen comparable growth in laboratories equipped to render the finest professional services to industrial, in-plant and other independent producers. Old established industrial film producers, many government film production centers, and the majority of big manufacturing and industrial firms who maintain movie making departments long have been steady patrons of these labs; indeed, without the extensive services which the commercial laboratories offer, these film producers probably could not have attained the important positions they now hold.

Every day, of course, hundreds of new 16mm and 35mm motion picture projects are started outside of the theatrical film field, and in some cases by film



METHOD OF PREPARING 16mm films for variable-length dissolves from 12 to 90 frames, as recommended by Hollywood Film Enterprises, Hollywood. Add two additional frames to desired effect. This method is advantageous where original scene is short and a dissolve is desired to produce smooth continuity. Dissolve should be indicated by a double "XX" scribed on edge of the original at the center of the dissolve, and length of dissolve noted on cue sheet furnished with film.

METHOD OF PREPARING variable-length fades from 12 to 90 frames. Add two additional frames to the desired effect. Fades are indicated by arrows scribed on edge of the original, as illustrated and indicate the original cut to A and B rolls. A fade-in and fade-out may follow each other on the same roll, providing they are of the same length. Length of fade desired should be specified on cue sheet.



ZERO CUTTING—This diagram illustrates the minimum requirements for the overlap when setting up this method, as recommended by Hollywood Film Enterprises. When possible after indicating the cut (by scribing an "X" on both the A and B originals) permit the overlap to run as long as possible ahead and behind the cut. This will also assist in re-editing, if necessary, and protect your originals for possible use in other productions. Cuts which occur in less than 24 frames from preceding cut must be set in A-B rolls with black leader.

BLACK LEADER checkerboard cutting is normally used when the original can be cut to length. An offset splice is needed for this method.

makers not entirely familiar with the scope of the services offered by the nation's film, special effects, title and sound recording laboratories. To familiarize these producers with the laboratory services available to them to the end that such knowledge will make it possible for them to greatly enhance the professional quality of their films, is the purpose of this article.

The first time you read a film lab's price list you'll probably wonder why such a wide array of services are catalogued. All you really want, you say, is to have your film developed and printed. But professional film production requires more than just this. Invariably there are special photographic effects, fades and lap-dissolves required to give films the necessary smooth, professional "look" on the screen. And then there are titles to be made, sound to be recorded, and editing and cutting to be done. Shooting the picture is just the beginning.

The two basic laboratory processes for commercial motion pictures, of course, are the negative and reversal methods. Negative-positive, the standard in 35mm, is directly comparable to still photography, where the negatives from a camera are used to make positive prints.

From "Dailies" To Work Print

In the negative-positive process, the exposed but undeveloped negative is sent to the lab which makes a positive print of the developed negative. The film producer or his editor uses these positive prints, or "dailies," in putting together his work print of the picture. When the work print has been approved, either the studio or laboratory edits the original negative in conformance with it. Prints for showings are then made directly from this edited negative.

With the reversal process, there is no original

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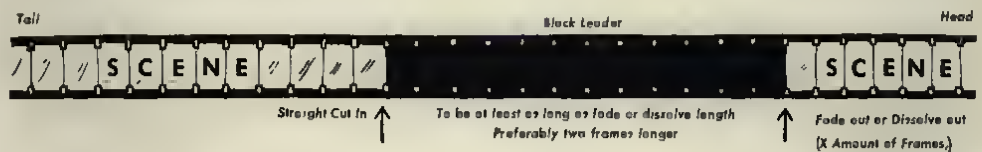
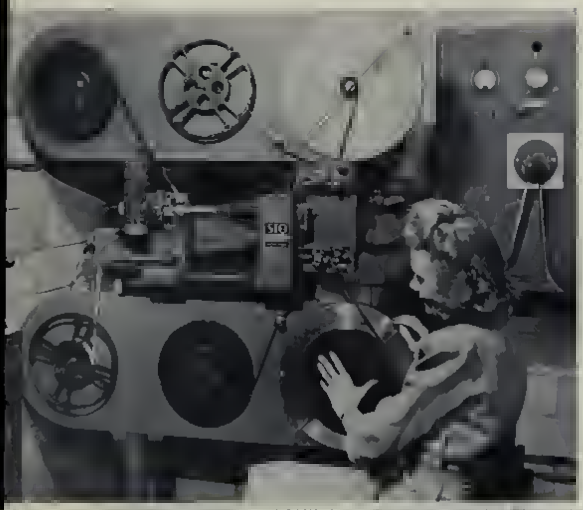


THE RULE TO FOLLOW when fade or dissolve is required, before or after a straight cut: When a scene fades or dissolves out in a given length, and the following scene on the same roll (A or B) is a straight cut-in, a black leader pad must be inserted that is at least the same length as the fade or dissolve action, preferably two frames longer. This applies also when the situation is reversed—i.e., when a scene straight-cuts out and is followed on the same roll (A or B) by a fade-in or dissolve-in.



COLOR RELEASE prints and B&W dupe negatives are made with traveling matte effects and transitions in this step printer. Matte reel at left controls light reaching color original and raw stock at right. (Photo courtesy Colvin Productions, inc.)

negative but rather a "master positive." A work print of this film, when required, is made on reversal stock. Some producers project the original film when selecting the best takes before ordering work prints; and a few do part of their editing with the original. Release prints are made either by the reversal process or by a duplicate negative for printing in the negative-positive fashion.

Most color release footage is made directly from the color reversal original. Black-and-white prints, in orders of 3 or more, are generally more economical in the dupe negative method. Dupe negatives give a better quality, too. B&W prints from color originals offer the same two optional methods.

The lab situation gets a bit more complicated when you need fades and dissolves. The standard method for producing these effects in 35mm is to print special low-contrast negatives, known as "fine grains," for each scene affected. The lab effects-man rephotographs the positives in an optical printer, incorporating the desired fades, dissolves, and wipes.

Importance of A-B Rolls

In the following paragraphs, some of the specific services laboratories offer film makers and what these services contribute to a film in terms of professional finish will be described.

A—B roll effects, once the special luxury of a few producers having their own film printing equipment, now are available to all. The A—B roll method makes it possible to put dissolves in 16mm color release prints without resorting to the use of dupes or the need to make dissolves in the camera. In the A—B roll method, the film to be printed is put through the printer two or more times. To make a dissolve, which calls for an overlap of two scenes, certain prescribed areas of the raw print stock receive exposure in printing runs with both the A and B rolls.

How Lab Makes Lap-dissolves

When making release prints or dupe negatives from 16mm color or B&W reversal originals, fades may be added by merely dimming the printer light. Lap-dissolves require double-printing, and therefore the picture is set up in A—B rolls. (See diagrams on page 604.) The outgoing scene is on one reel and the incoming one on another. The laboratory prints the A roll first, which includes all footage up to the first dissolve. At this first dissolve, the printer light fades out and only leader stock runs through until the light fades on for the incoming scene of the second dissolve. Then the B roll is printed onto the same raw stock. This time, the printer light remains out while the previously-exposed footage runs in contact with first part of the B roll. The light fades on while the incoming scene of the dissolve moves across the printing gate. Because the fadeout of one scene is printed over the fadein of another, the final effect is a smooth lap-dissolve.

Producers using the A—B system can deliver Kodachrome or Ektachrome originals to the lab

Continued on Page 621

CHART BELOW shows at a glance cost of printing and other laboratory services for 36-ft., 100 ft., and 400-ft rolls of film on the basis of costs ranging from ½-cent to 18 cents per foot. For example, cost of an Ektachrome master print, 400-feet in length, at 18¢ per ft would be $72.00; 35 feet of 16mm B&W dupe negative at 14¢ per foot would cost $5.04

LABORATORY COST CALCULATOR

Price per foot	per 36′	per 100′	per 400′
$0.005	$0.18	$0.50	$2
.02	0.72	2	8
03	1.08	3	12
.04	1.44	4	16.
.05	1.80	5.	20
.06	2.16	6.	24
07	2.52	7	28
08	2.88	8	32
09	3.24	9	36
10	3.60	10	40
11	3.96	11	44
.12	4.32	12	48
13	4.68	13	52
14	5.04	14.	56
15	5.40	15	60
.16	5.76	16	64
.17	6.12	17	68.
18	6.48	18	72

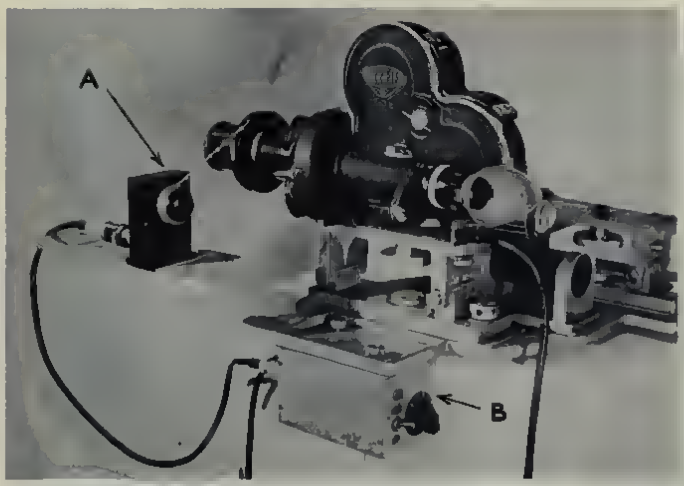


FIG 1—Arriflex 16 camera with Kelvin & Hughes automatic exposure control system. Arrow A indicates gearbox and motor drive to the iris, arrow B the transistor amplifier

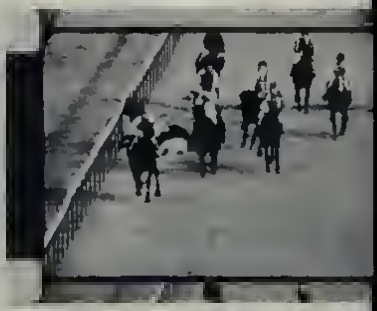


FIG 2—Film clip from typical 16mm film recording which illustrates picture quality obtained from camera equipment at left

A BRITISH FILM PATROL SYSTEM*

The access time for photography to inspection of the processed film is only a few seconds.

By E. R. TOWNLEY, A.R.P.S.

THE KELVIN-HUGHES range of step-by-step rapid processing photographic projectors is now well known; these are automatic equipments which photograph on to 35mm film, process this rapidly and then project it in the form of a theatre type display. The access time from photography to inspection of the permanent record is only a few seconds.

These equipments utilize a jet spray processing system where a number of jets are arranged in a common processing pot, each jet spraying a separate solution at the appropriate time. The jets are of the Venturi type operated by compressed air, and a fine atomized spray is applied at once to the whole of the processed format. This system of processing, being of the total loss type, gives a constant high standard of performance, but is nevertheless economical when compared with conventional tank type machines. An inherent advantage of the Kelvin-Hughes jet system is the fact that liquids may be switched by controlling compressed air by means of solenoid valves and thus there is no active switching of liquid lines nor consequent problems of sticking and corrosion.

There appeared to be a demand, particularly by the specialized industries, for a continuous film processor which was automatic in nature, constant in performance and capable of providing rapid access to records which may vary from a few feet to thousands of feet. The main needs of the cine industries are met by a wide range of tank and spray type processors whose prime purpose is to achieve high quality processing at a high film output speed. Rapid access is not their aim and it may be a

*Condensed from "Rapid Reversal Process And Special Projection System For Film Patrol," *British Kinematography*, Vol. 38, No 4, and reprinted by permission

considerable time before the first portion of processed record emerges from such equipment.

Kelvin-Hughes decided to design a range of compact continuous processors to meet the rapid access conditions stated above, and thus to fill a gap for equipment of this type. Because of considerable experience with atomized jet spray processing techniques, it was decided to design the equipment utilizing these, since their effective nature in terms of continuously applying fresh solutions to the emulsion is desirable to achieve rapid access. Further, the total loss nature of this type of applicator is desirable to maintain constant quality.

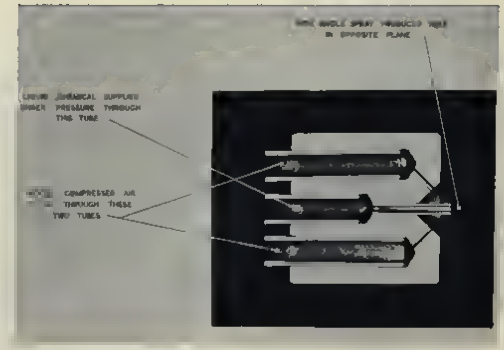


FIG 3—Cross-section diagram of jet spray unit of film processor

Prototype Equipment Developed

A number of prototype equipments based on these techniques were developed for particular customers and it was following this that The Race Finish Recording Co. (of London) invited Kelvin-Hughes to supply equipment to meet the specific needs of Film Patrol. Film Patrol is the system introduced to England by the Jockey Club, whereby a cine film is taken of most of a horse race from a number of selected positions on the course. The films are edited, processed and must be available for projection within a very short period for subsequent analysis. The record is primarily required for assessing infringements but is also of great value for training and tactical purposes.

An existing American photographic system produces a completed film positive in about 4 minutes, but The Race Finish Recording Co. required this to be much shorter. By an interesting combination of chemical and optical techniques, Kelvin-Hughes designed equipment capable of producing a stable, dry positive in 60 seconds. This is an excellent example of the system's approach to rapid access processing, where the film and processing applicator system have been tailored for each other in conjunction with optical techniques. Kelvin-Hughes designed and supplied automatic photo-electric control gear for the cine cameras and specially modified an Ampro projector for subsequent projection on to the screen. The various parts of the system are dealt with in sequence.

Camera and Automatic Photo-Electric Control System

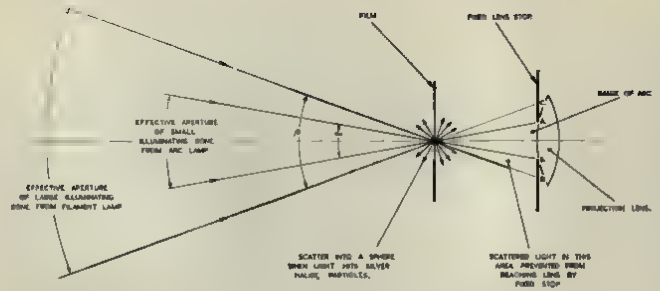
The camera used for Film Patrol by The Race Finish Recording Co. is the Arriflex 16, and this may utilize a wide range of lenses from 1 in. to 22 in. focal length.

Continued on Next Page

FIG 4—Front view of RP-1 processor

FIG 5—Interior view of RP-1 processor

FIG 6—Processor with front cover removed



SIMPLIFIED DIAGRAM OF OPTICAL PROJECTION SYSTEM TO UTILISE HIGH CALLIER COEFFICIENT OF FINE GRAIN SILVER HALIDE EMULSION.

FIG 7—Diagram illustrating principles of optical system.

Since the finished film is required to be a positive transparency, reversal processing is necessary. It is well known that unless a considerable loss in speed can be tolerated, the latitude will be much smaller than that to be obtained from negative materials. This feature, coupled in particular with English weather, even for the short duration of a horse race, implied the necessity for automatic camera exposure control. Even in countries which are naturally blessed with better weather than that indigenous to us, this must be a great advantage.

It is evident that the unit has to be exceedingly flexible to meet such a wide range of lenses from 1 in. to 22 in. focal length, and, an accurate and elegant system was adopted which is independent of lens focal length, angle of view and the relation between stop number and diaphragm rotation.

Automatic Exposure Control

The control system is based on the closed loop principle, in which a photo-cell samples the light falling on to the film, producing a signal which is amplified and compared with a reference voltage. Should a differential be detected, a motor drives the lens iris to restore the balance condition. The selenium photo-cell is mounted into the focusing tube of the Arri 16 camera and may be very easily withdrawn for focusing or sighting. The amplifier is completely transistorized and has facilities for accommodating variations in film speed and camera speed. The lens iris ring is driven by a simple DC motor via a gear box and special drive belt. The amplifier is operated from a 24-volt DC battery and consumes about 50 milliamps.

It will be seen that, since the light which falls on the film is being metered, the system is accurate and independent of view problems. Further, since the control system is a closed loop servo, it does not matter if the drive belt to the iris slips, as it will continue driving until null conditions are achieved.

Since the light falling on the photo-cell is similar to that needed to expose the film, it will be appreciated that there is a sensitivity problem concerned with the signal-to-noise ratio of the amplification required. The present system copes with speeds up to 240 ASA or BS. The response time is such that a lens stop can be changed in 0.25 of a second with a starting lag of less than 0.1 of a second.

Theoretically, the system can be applied to any camera, but the arrangement is particularly convenient with the Arri 16, since it has a quadrantal shutter with two mirrors and two blanks, the output from the mirrors being viewed through the telescope. A small selenium photo-cell is fitted into this telescopic viewer to receive the light input. Thus, the electric signal is chopped DC and the problems of amplification are somewhat simpler than they would be for a DC output.

Since a selenium photo-cell has been chosen, it is normally considered unnecessary to compensate this further with filters for use with panchromatic film.

Fig. 1 shows the Arriflex 16 with the complete Kelvin-Hughes automatic photo-electric exposure control. Arrow A shows the gear-box and motor drive to the iris and arrow B the transistor amplifier.

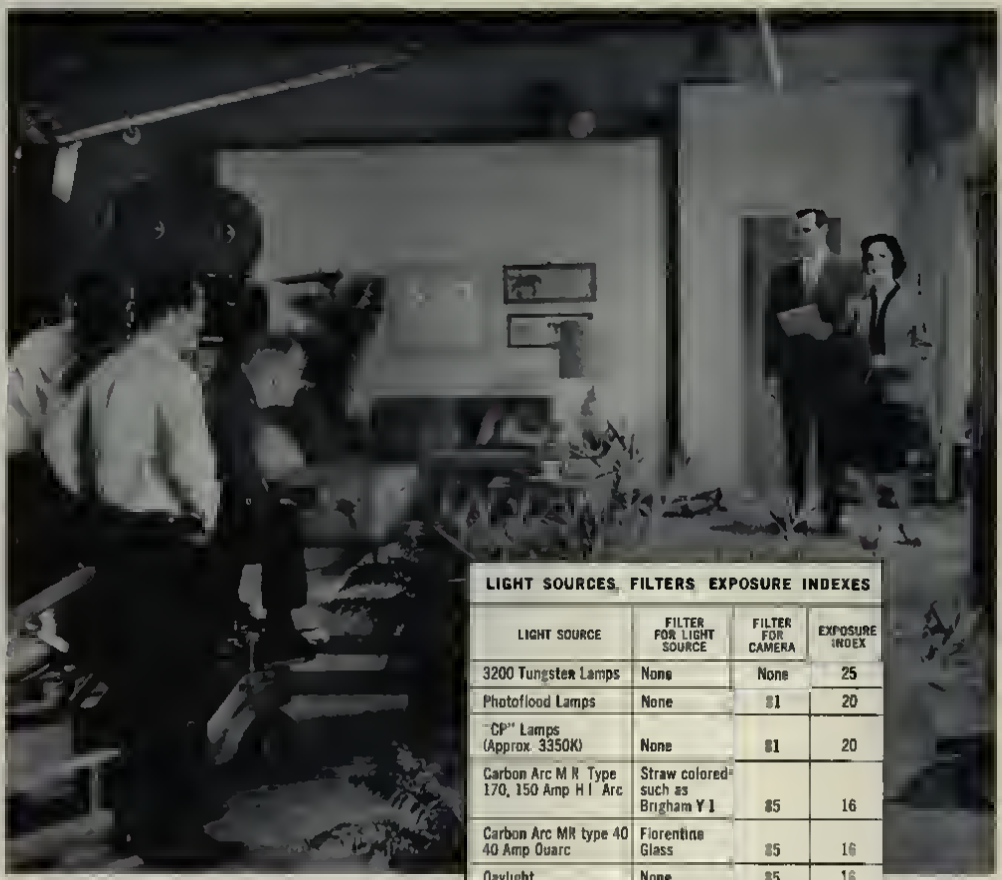
Processor

Since a fully processed positive transparency was required in a very short period of time Ilford RX was chosen, which is a thin, hardened, panchromatic recording film, having fine grain and a speed of about 80 ASA. This film had already been specially designed by Ilford Ltd. for Kelvin-Hughes jet spray processing systems, and it is a versatile film in the sense that it processes effectively and rapidly, both for negatives, and positives by reversal.

A 16mm projector operating at 24 frames per second consumes film at a linear rate of 36 ft. per minute, and it was decided that the processor should feed out film at 40 ft. per minute, thus building up an increasing loop between the projector and processor. It will be seen that the size of a machine in terms of built-in film capacity will be proportional to the processing access time. If this be 5 minutes, then 200 ft. of film must be accommodated, whereas, if this could be done in one minute, then only 40 ft. of film need be incorporated.

Kelvin-Hughes have for a number of years effected reversal

Continued on Page 618



LIGHT SOURCES, FILTERS EXPOSURE INDEXES

LIGHT SOURCE	FILTER FOR LIGHT SOURCE	FILTER FOR CAMERA	EXPOSURE INDEX
3200 Tungsten Lamps	None	None	25
Photoflood Lamps	None	81	20
"CP" Lamps (Approx. 3350K)	None	81	20
Carbon Arc M R Type 170, 150 Amp H I Arc	Straw colored such as Brigham Y 1	85	16
Carbon Arc MR type 40 40 Amp Quarc	Florentine Glass	85	16
Daylight	None	85	16

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REHEARSING—The blimped Mitchell camera, mounted on a dolly, is being maneuvered by grip (center) as actor Vincent Price (background) descends stairs for a scene for "The Pit And The Pendulum." The lighting is typical for suspense scenes.

"The Pit And The Pendulum" . . .

A STUDY IN HORROR FILM PHOTOGRAPHY

By HERB A. LIGHTMAN

"THE PIT AND THE PENDULUM," produced by Roger Corman for American-International Pictures, proves that a big picture can be made on a modest budget—especially when it is carefully planned and the creative talents involved are given unlimited opportunity to create.

Based on the famous Edgar Allen Poe horror classic, the film is lavishly mounted and imaginatively photographed by Floyd Crosby, A.S.C. Except for a prologue consisting of exteriors, the story's action takes place entirely within the forbidding confines of a medieval Spanish castle replete with massive main hall, ornate bedrooms, secret passages, dungeons, tombs, torture rooms and, of course, the formidable "pit" with its massive stone altar over which is suspended the swinging pendulum blade used to torture and sometimes slice up hapless victims placed beneath it.

Except for the absence of big name stars in the cast, the film boasts production values comparable to pictures costing five times as much.

"We achieved what we did on a low budget because we carefully planned the whole production in advance of starting the cameras," Director-Producer Corman explains. "Thus, when we moved

into the studio for fifteen days of scheduled shooting, we didn't have to start making decisions. Because of our pre-production conferences with Director of Photography Floyd Crosby and Art Director Dan Heller, everyone knew exactly what to do, barring any last-minute inspirations on the set.

How Rehearsals Paid Off

"Previously, I had painstakingly rehearsed the actors so there was complete understanding as to what each was to accomplish in each scene. This is most important; there is nothing worse than to be on the set and ready to roll, only to find that director and actor have different views as to how the scene is to be done. Thanks to pre-production planning and rehearsals, there was no time wasted on the set in haggling and making decisions.

"In our set design, choice of costumes, and in matters related to the atmosphere of the period of the story, we aimed to be as authentic as possible, without becoming slaves to authenticity. Flexibility keynoted the whole operation so that whenever we believed it expedient, we would heighten certain dramatic and shocker effects. Here, Floyd Crosby contributed some outstanding lighting and camera work to enhance the illusion of realism—which, perhaps, was not so much realism but a suspension of disbelief."

Much of the film's effectiveness as a thriller is due to its pictorial scope borne of the production design of Art Director Dan Heller. Having worked previously with Corman and Crosby on several pictures, he was very much a part of the production team that created "Pit And The Pendulum."

"We wanted a set having many levels and ample space to afford the utmost freedom to the camera," Heller explains. "Four or five rooms were erected on the stage so they were interconnecting, and we used wide archways and stairways without balustrades. Thus the camera could move freely through the entire series of rooms for sustained takes, if necessary. Massiveness keynoted the design and construction of all sets so that the players would be dwarfed against the vast walls, and in the massive archways, etc."

Heller's forbidding split-level castle, with its many rooms, passageways and catacombs occupied four sound stages at the California Studios in Hollywood. Had it been necessary to build the sets from scratch, cost of construction alone would have greatly exceeded the picture's budget.

After Heller drew up the floor plans and made key sketches that visualized how the sets were to look, he next scouted the back lots and prop lofts of the major studios in search of available set units that could be rented and put together to form the sets he had conceived for "Pit And The Pendulum."

Like a Giant Jigsaw Puzzle

At Universal-International Studio, massive archways, fireplaces, windows and doorways, and several torture machine props—all from dismantled sets of long-forgotten Universal productions — were available. At other studios, soaring stairways and huge stone wall units were located. From this fund of second-hand set pieces, Heller selected what he needed and had them delivered to California Studios. Here the various bits and pieces were fitted together like a giant jigsaw puzzle, following his floor plans. Though the period of the story was Spanish 15th Century, often a French or German Gothic window was used instead of one of Spanish

Continued on Page 623

PREPARING TO SHOOT the pendulum scene. Director of Photography Floyd Crosby stands beside camera which is focused downwards on player enacting role of hapless victim of the swinging blade. Note use of barn doors and flag to prevent light reaching camera lens, also use of target and scrim before lamp at left to soften illumination falling on actor's face.

THE SWINGING PENDULUM slowly descends toward victim chained beneath it, as Floyd Crosby's camera, in background, films the scene. Here a cookie has been added at left to give a subtle shadow pattern to light falling on player; also, flag on century stand, visible in photo at left, has been moved closer to the lighting unit in right foreground to shield light from camera.

REPORT ON ASC'S RESEARCH PROJECTS

Hollywood film industry studying first three technical recommendotions issued by the Research and Educational Committee of the ASC.

By WALTER BEYER
Chairman, ASC Research and Educational Committee

SINCE THE INCEPTION of the Research and Educational Committee of the American Society of Cinematographers, in June, the Committee has developed and issued bulletins on three ASC recommendations of importance to the motion picture industry. These consist of "Screen Brightness Level For Film Review Rooms," "65mm Camera Aperture Dimensions," and "Focusing Chart For Daily Rushes."

The initial project of the Committee—to propose a standard of uniformity of screen brightness and color temperature levels for studio film review rooms—was aimed at establishing proper maintenance of recommended brightness and color temperature to eliminate uncertainties in print densities and color balance, which will result in substantial savings through reduction or total elimination of the reprinting of countless scenes.

Our most recent survey has shown that the review rooms in Hollywood studios and film laboratories operate with a screen brightness between 16 and 18 foot Lamberts, excepting two—one of which operated at 15 and the other at 20 foot Lamberts plus. The Society of Motion Picture and Television Engineers has a proposal for a screen brightness standard in preparation which is understood to recommend a brightness range from 14 to 18 foot Lamberts.

Extensive tests by the ASC's Committee have indicated that such latitude is unacceptable for studio-laboratory cooperation, and that the recommended range of color temperature was too great. It is felt that the ASC's recommendation, which is set forth below, will better satisfy the day-to-day operational needs of both studios and laboratories.

It should be pointed out that our recommendation is entirely within the over-all scope of the proposal of the American Standards Association. Special attention is called to Point No. 5 of our recommendation. In the course of our survey, it was found that certain types of projection lenses, and especially anamorphic attachments, caused noticeable reduction of color temperature, thus requiring that different color temperature readings be established for non-anamorphic (flat) and anamorphic projector setups.

ASC RECOMMENDATION No 1
SCREEN BRIGHTNESS — AND COLOR TEMPERATURE LEVELS FOR REVIEW ROOMS

1. Scope

1.1 This recommendation specifies the brightness of projection screens for Review Rooms in Studios and Laboratories.

2. Definition

2.1 The screen brightness shall be measured from the viewing or seating area with the projector running and no film in the gate, using a meter calibrated directly in foot Lamberts.

3. Brightness Level

3.1 The brightness at the center of the screen shall be 16 foot Lamberts plus 2, minus 0.
i.e. 16 ft.-L to 18 ft.-L maximum.

4. Light Distribution

4.1 The horizontal light distribution shall be 80% plus 10, minus 10, i.e. 70% to 90% of the

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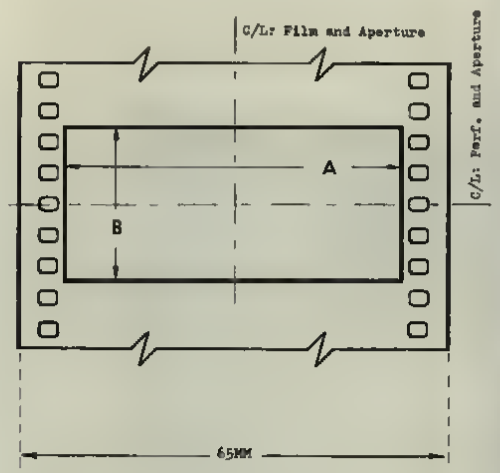

65MM FILM AND APERTURE dimensions recommended by the Research and Educational Committee of the American Society of Cinematographers. These are described in detail in the text on page 617.

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ASC'S RESEARCH PROJECTS

Continued from Page 614

center reading should be obtained at a distance of about 5% of the screen width along the center line and inside the left and right edge of the screen.

5. Color Temperature

5.1 Non-anamorphic (flat) projection: The color temperature of the light returning from the screen shall be 5400° Kelvin. It is desirable to achieve this reading with no greater variation than plus or minus 200° K.

5.2 *Anamorphic projection:* It will be found that color temperature readings of the projection light going through anamorphic attachments and returning from the screen are 800° K and more below the readings as stated in paragraph 5.1. This condition later will also prevail in theatres using anamorphic attachments since these cause an alteration or shifting of the color temperature toward yellow.

5.3 It is important to establish for each review room the difference between non-anamorphic (flat) and anamorphic color temperature values and to check them by way of frequent meter readings.

5.4 Full cooperation and exchange of information on their respective readings between laboratory and studio when working on the same production material is essential to avoid serious differences of opinion on color balance.

5.5 With the aid of color temperature conversion filters the readings between laboratory and studio should be equalized as closely as possible.

One of the important projects of the ASC's Research and Educational Committee is to establish recommendations for the standardization of apertures, ground glass and camera finder markings for both theatrical and television film productions, and also to provide recommendations for all wide-screen processes utilizing other than standard 35mm cameras. The project, therefore, will include the entire scope of wide-screen systems as described and illustrated with flow charts in the opening chapters of the *American Cinematographer Manual*, pages 44 to 52.

The first recommendation prepared by the Committee defines the 65mm

camera aperture dimension proposed for use on all such cameras presently in operation in Hollywood studios:

ASC RECOMMENDATION No. 2
65MM CAMERA APERTURE DIMENSIONS

1 Scope

1.1 This recommendation specifies the aperture dimensions for a motion picture camera using 65mm negative raw stock with a perforation pitch of 0.187" and having a pull-down stroke of 5 perforations per frame.

2 Dimensions

2.1 The dimensions shall be as given in the diagram and table. (On Page 614)

2.2 The dimensions of the 65mm negative raw stock to be used in these cameras shall be in accord with ASA PH 22.118-1961.

3. Usage

3.1 This camera aperture is identical for all motion picture cameras for theatrical production methods in both non anamorphic and anamorphic photography.

3.2 The anamorphic ratio presently used in conjunction with this aperture is 1.25:1.

3.3 Negatives obtained in shooting with the above aperture are original negatives and can be used for making release prints in 70mm, 65mm, and 35mm, and all non-anamorphic and anamorphic as well as extraction prints for multiple film release.

3.4 All aspect ratio and composition considerations for prints under 3.3 are expressed in specific finder and/or ground glass etchings in accord with projector printer apertures for contact and reduction print procedures.

Focusing Chart Recommendation

The purpose of the ASC's Research and Educational Committee is not only to disseminate information and standardization recommendations on engineering procedures, but also to submit to the industry proposals and suggestions that the Committee believes will be beneficial to producers, since they may result in money savings or at least facilitate certain operational procedures.

One of the important proposals developed by the Committee and which has been submitted to engineers and others in the industry defines a Focusing Chart for use in screening Daily Rushes. It is worthwhile at this point to emphasize the economic angle involved in this suggestion:

The fact that daily rushes are essentially "green film" frequently creates projection problems due to the loss of focus control. Invariably this results in time-consuming re-runs of the film to determine if the film is o.k. or if retakes will be necessary. If the proposed focus chart can eliminate this problem, which it did when practically used, we believe it worthy of consideration.

ASC RECOMMENDATION No. 3
FOCUSING CHART FOR DAILY RUSHES

Contrary to the practice followed in theatres in the screening of feature films, where the projectionist has ample title and credits footage on which to set the focus of his projector, daily rushes screened in studio review rooms are invariably focused when the most critical picture material is already on the screen.

"Re-focusing" and/or" going through focus" is done repeatedly throughout the daily showings since the quality of such material presented on the screen is of the highest concern to production.

Some material that hits the screen first may consist of night scenes or other material that might be hard to focus under normal circumstances.

The following proposal is being submitted for consideration:

A focusing chart should be prepared consisting of the ASC emblem, some lettering to the left and right of it, including index lines for both 2.35/1 and 1.85/1 ratio to aid proper framing.

It is contemplated shooting a thousand-foot reel of negative of this chart and such negative would be submitted to the lab. The lab would then cut off ten to fifteen feet of this negative and splice it in so it will be printed at the head of every reel of dailies to be delivered to the studio, thus giving a seven to ten second appearance of the focus chart on the screen at the beginning of each reel and also, naturally, at every change-over.

Should any studio re-assemble its dailies, the editorial department would specify that the focus leader should always be placed at the head of each reel of dailies.

A most important feature of this proposal is that the focus chart would always be printed on the same film material as the daily rushes, and thus being on green film identical to the picture footage, image sharpness would

be consistent with that of the picture footage.

Special emphasis is made of this point because other proposals have been made for attaching pre-photographed and pre-printed footage of a focusing chart to daily film footage without taking into consideration that such film may be worn or dried out and therefore, in its plane of best focus, would not be identical to that of the green film of the daily rushes.

There is an economical footnote to this proposal, too. Most of the studios have ample short-end footage which could be used in making the required negatives for the proposed focusing chart for dailies, and the adoption of the idea would not entail added expenditures for negative stock.

In a future article I hope to report on one of the most vital projects yet undertaken by the ASC's Research and Education Committee. Purpose of this endeavor is to induce manufacturers to include DC restoration in all future black-and-white TV receivers, thereby greatly improving the reception quality of television films. The professional skill and workmanship of the directors of photography will undoubtedly benefit from this new effort and project of the Committee. ■

FILM PATROL SYSTEM

Continued from Page 610

processing for very rapid access in a matter of about 10 seconds on their Rapid Processing Photographic Projectors, which are step by step instruments. In order to achieve these fast access times, the positive image is produced by development, bleaching, washing and drying; no re-exposure nor re-development being carried out. This saves the time and complexity of these two operations and also increases the brightness of the highlights because of lower fog. The resultant image consists of grains of silver halide rather than crystals of developed silver, and it is the peculiar properties of the fine-grain silver halide crystals, which are utilized optically in order to achieve the desired film characteristics.

Thus, the processor which is known as RPI Type 10. was designed to be capable of handling 16mm or 35mm film and to cope with normal negative processing or the special halide reversal processing to achieve rapid ac-

cess. Using Ilford RX film, the reversal process requires one minute dry-to-dry and thus 40 ft. of film is accommodated in the machine. A vigorous caustic soda/phenidone/hydroquinone developer is used, followed by a chromic acid bleach. Initial washing is done with dilute hypo which is very effective in removing undeveloped silver halide grains together with dichromate staining. A final water wash is then followed by drying, which is a mixture of impingement and radiant techniques.

It will be appreciated that the speed of processing depends on the strength of solutions, the temperature of solutions and the number of jet units spraying on to the film. This latter point is important because the closer the proximity of jet units, the more emulsion that is vigorously treated with fresh solution for any period of time. However, economic considerations necessitate a compromise, and it was decided that three development and three bleach jets were suitable for a film speed of 40 ft. per minute, and an access time of 60 seconds.

The droplet size of the atomized spray has been determined empirically. If this be too large, then processing is not uniform unless the consumption of liquids is very high whereas if the droplets are too small, they do not condense rapidly enough on the film, and are, therefore, ineffective. The jet spray profile is rectangular, and this is achieved by using two air lines and one liquid line as will be seen from Fig. 3, which shows a section through a jet unit. This shape of spray permits of particular economy. The jets are constructed in Inconel or Hastelloy "C".

In order to cope with a range of processing requirements and to utilize a wide range of films and processing conditions, together with varying film widths, the Venturi jets just described are further assisted. A small air pressure is applied to the top of the processing fluid reservoirs, and this may be varied to boost the jet spray according to requirements. For 16mm film, a thousand feet of material requires 3 litres each of developer, bleach and wash.

The apparatus is temperature controlled by means of pre-heating the compressed air feed to the Venturi jets, in addition to internal heaters which are thermostatically controlled. Overall control is at 100°F. The apparatus has been initially designed for utilizing pre-hardened films but a large number of hardened commercial varieties of film are presently being evaluated. The Ilford recording films, RE, RX, BU and BY are eminently suitable for use, together with Microneg pan, Kodak Microfile and Kodak R-40. A particularly good film is Kodak Tri-X reversal, which behaves very well both as a negative and for reversal purposes. However, whereas negative processing can be successfully carried out at 40 ft. per minute with one minute access time, it is necessary to reduce the through put speed of the machine for such films as Tri-X if reversal is required.

The halide reversal process hitherto described enables rapid access to be achieved. But where it is necessary to have the conventional silver reversed image, then this can often be simply achieved in the RPf equipment by running the film through the apparatus again, but this time with the bleach switched off, since re-exposure will have been achieved when the film emerged into the light.

Figs. 4, 5, and 6 show various views of the RPI processor, and the arrangements of units, interlocks and controls. It should be observed that the processing unit is divided into three basic compartments which are sealed from each other where the film emerges.

The whole processor has been designed with long life and low maintenance as its aim, together with simplicity of use. A novel and valuable feature is the provision of a built-in simple plumbing system so that after use the bearings and jets may be flushed with water easily and rapidly.

Projection System

Before proceeding with a description of the optical projection system and the principles involved, it is desirable to review the fundamental concepts and definitions concerned with optical density.

The opacity of a material may be defined as the ratio of the incident light to the transmitted light and is expressed as I_o/I where I_o is the incident light flux and I the transmitted light influx. Then density is defined as the log of opacity and is expressed as

$$D=\log_{10}I_o/I.$$

In fact, this definition of density is meaningless when applied to photographic materials unless the conditions of measurement are defined. This is

because the silver image scatters some of the transmitted light When parallel light falls on to a normal silver image some of the light is scattered (i.e. reflected, refracted and diffracted) but the majority proceeds normally after the appropriate amount has been absorbed.

If only the transmitted parallel light be collected and compared with the incident light then the *specular density* will be obtained. If all the light diffused or scattered into a hemisphere by the image be collected then the *diffuse density* will be obtained.

Since in the latter case much more transmitted light is collected (*I*). it is evident that the measured density will be lower, and thus the diffuse density will always he less than the specular density. In normal photographic procedure the diffuse density is significant where contact printing is concerned, while for printing via a condenser enlarger the operative density is somewhere between specular and diffuse.

It will be seen that the ratio of specular to diffuse density is important This ratio is known as the Callier coefficient (*C*).

Thus, $C=Ds/Dd$ where Ds=specular density and Dd=diffuse density.

It should be appreciated that nearly all materials scatter and absorb light to varying degrees. In the case of the developed silver image, incident light is mainly absorbed and thus the Callier coefficient is not much greater than 1.

When a fine-grain undeveloped silver halide image is considered in place of the normal silver image, some interesting properties are apparent in the light of the above discussion The fine particulate nature of the emulsion is responsible for a large amount of scatter in all directions, and thus depending on the optical projection system used, a high Callier factor may be achieved.

Callier factors for silver halide emulsions vary widely depending on grain size, distribution and coating weight, and in practice, fall between about 1.2 and 3.2. It will be seen, therefore, that if an optical projection system be devised to exploit the light scattering characteristics of such films, then it is possible to obtain a high projected density at the screen without the necessity for the chemical stage of converting the silver halide to silver. The Kelvin-Hughes halide reversal process achieves this, although visual observation of the film suggests that the contrast is low

Fig. 7 shows diagrammatically how the high Callier factor is utilized:—

When light falls on the film it is scattered in all directions by the silver halide crystals. It is evident that if the density at this point is to appear high, then the minimum of scattered light must be collected by the projection lens. This is achieved by using a low relative aperture illuminating cone represented by angle *a* which forms an image of the light source AB at the projection lens A tungsten filament projection lamp is normally imaged at CD, to fill the projector lens and it is evident that the illuminating cone represented by the angle *b* will permit more scattered light to enter the projection lens and thus the density at the screen will he reduced. It will he seen that using the lower aperture cone *a*, scattered light from the emulsion may still enter the projection lens at AC and BD and thus limit the available contrast This is prevented by placing a fixed stop behind the lens whose aperture is AB.

As an example of these effects a standard Aldis 2-in. by 2-in slide projector was used to measure the contrast at the screen available from Ilford RX film A standard 300 watt filament lamp was compared with a German Osram 75-watt mercury arc lamp type HBO 74, having an arc size 35mm by 1.5mm. The contrast with and without a fixed stop of ⅜ in diameter was measured at the screen using a photocell corrected approximately to eye sensitivity. The effective relative aperture of the 4 in. projection lens was about f/11 when used with the ⅜ in. stop:

Lamp	*Contrast Ratio*
300 W. filament lamp—no stop	46:1
300-W. filament lamp—⅜ in. stop	66·1
75-W. mercury lamp—no stop	80:1
75 W mercury lamp-⅜ in. stop	480:1

It is interesting to note that with a thin hardened recording film like Ilford RX, the maximum projection density of unexposed emulsion is 2.8, whereas that of the developed silver image is 1.8. Thus, the film is amenable to rapid access processing and may have higher final contrast than if the film had been conventionally re-exposed and redeveloped by a longer process.

Contrast at the screen is defined as the ratio of highlight illumination to "maximum black" illumination in the projected image Because of the low fog the highlight illumination is almost as high as with no film in the gate, and this figure will be more or less independent of relative aperture since the almost grainless gelatin transmits specularly. However, the "black" density will he dependent on the relative aperture and so the contrast at the screen will depend on this. Thus, the silver halide scattering film has the interesting property that the gamma of the projected transparency may be varied by changing the conditions of illumination.

It is now expedient to consider how to achieve a low relative aperture illuminating cone giving sufficient screen illumination. (See Fig. 7.)

A standard optical system as used in normal cine projectors with a filament lamp, would not utilize the Callier factor of the emulsion very effectively even if the projector lens were stopped down to the same relative aperture AB corresponding to angle *a*. Further, the illumination at the screen would be unacceptably low, and thus other alternatives must be considered.

The requirement is for a compact source of high brightness, and fortunately a range of xenon and mercury compact source arc lamps are available which have these properties. A 250-watt mercury lamp having a 4mm arc was chosen, and this arc was imaged via a standard Ampro condenser system on to the lens at AB The amount of light on the screen is about the same as that from a 750-watt filament lamp, and the 4mm arc provides the required low relative aperture. As a direct result of this low aperture, the projection lens performance is improved. In addition a cheaper lens of lower aperture could he used if desired. It should be noted that a lamp having a smaller arc would provide an even greater screen contrast if the fixed lens stop were correspondingly reduced in size. However, for the purposes of Film Patrol, the Ampro 16mm projector modified with a 250-watt mercury lamp with 4mm arc provides adequate contrast.

The mercury lamp described is available from Siemens and BTH and has an interchangeable cap, so that the 750-watt filament lamp may be directly replaced. Since the screen illumination is the same, there is a

saving in the cost of power. When operated on DC the lamp has a life of about 1,000 hours compared to about 25 hours for the filament lamp. Thus, although there is increased capital cost of the lamp, starter, and control ballast, together with the projector modifications, it may be economically advantageous to use the arc lamp. In addition, the arc is not sensitive to vibration and thus is particularly suitable for mobile applications such as Film Patrol.

The Ampro projector used for Film Patrol is a standard type which has been modified to utilize a 250-watt mercury lamp and in addition has been provided with analyzing facilities. The film can run forward or backward at variable speed and a hand-control unit is supplied for remote operation of these facilities.

The silver halide image has proved to be particularly suitable for tele-cine purposes. A small amount of light from the projector is imaged via a beam-splitting mirror into the TV camera tube from which it is routed via a closed circuit TV system provided by Pye to various monitors on the racecourse.

Fig. 2 shows a typical "still" of an actual 16mm cine record provided by Film Patrol. ■

MAKING THE MOST OF LABORATORY SERVICES

Continued from Page 508

properly prepared for A—B handling; or, if the lab offers an editing service, they may bring an edited workprint and original footage to be conformed to it. However, the charge for this work is often rather high, and it generally pays the semi-professional or small industrial producer to do it himself. Because good splices are important in a well-prepared film, some producers cut the scenes and place them in proper order on reels, unspliced, along with the required leader stock, and leave the final splicing to the lab.

Although A—B printing is most commonly applied to straight dissolves, it offers other possibilities, too. Titles superimposed over live-action backgrounds follow as the second most popular use. Once a picture is assembled in A—B rolls, it is not a difficult matter to provide titles having white letters over a live action scene from the picture. This requires: (a) color footage suitable in length and subject matter to be used with the titles, and (b) a high-contrast title film (white letters against black background) with the main titles linked in a series of dissolves. Title cameras are usually equipped with dissolving shutters, so it is no problem to make dissolves as the titles are photographed.

The background scene is placed at the beginning of one printing reel and the title footage at the start of the other. When both reels have been exposed onto the raw stock, the result is a superimposed title-scene. You have a choice of processes in shooting the title letters. Reversal film may be employed to photograph white letters on black title cards, or positive printing stock may be used to film black lettering on white cards. Black-and-white film is called for in either case.

Other optional title arrangements are: (a) background scene and opening title fade in at the same time; (b) background scenes fades in first, then followed by title; and (c) producer's regular color trademark title fades in, dissolves to background scene, and opening title fades in over it. An especially dramatic effect results from fading from one set of titles to another instead of dissolving, with the background scene remaining on screen in the meanwhile.

It is also possible to dissolve to a new scene at each title dissolve, if A, B, and C rolls are furnished the lab.

Still another application of A—B roll cutting, though not so well known, is in superimposing words or diagrams over scenes in the picture. An example is a film tracing a company's history which includes scenes of past events. Each scene begins with the date superimposed for a few seconds at the bottom of the frame—accomplished by the A—B roll method.

An entertaining way to present statistical information is to print it over normal shots. Data on steel production, for example, may be appropriately exposed over a scene of pouring the molten metal. Or a rising sales graph may be animated over a view of the client's products moving along the assembly line.

"Zero cuts" are a specialized use of

A—B rolls. Some labs have printers with instantaneous shutters to cut off the light, and thus can offer A—B cuts as well as dissolves. You may ask, "Why make cuts this way? Isn't it enough just to splice one shot to another?" Well, suppose you have only one take of an important scene which you want to include in two separate color pictures. And different lengths of the scene are needed for each picture. Zero cutting is the answer. The scene is spliced into the A roll, full length. The shots before and after it are spliced into the B roll. Both cuts are formed by closing and opening the printer shutter at the right times.

In addition, zero cuts are favored by meticulous producers who object to any evidence of splices on the screen.

And now we come to montages. Complex montages occasionally appear in color industrial films, and they reflect A—B printing developed to the highest degree. A sequence in a railroad film comes to mind. Here, views of the scenery along the right of way quickly dissolved from one shot to another, with the railroad's trademark continuously superimposed over it all.

This was accomplished by cutting the picture into A, B, and C rolls to produce three separate pictures on the screen at one time. Usually, there were two shots visible, trademark and scenery; but during the dissolve, three scenes filled the screen.

A four-way run, or A, B, C, D, printing, is used for even more involved effects. Naturally, the cost is greater for this work. Labs may charge about 2¢ a foot per print for each extra run. To avoid having an entire picture charged for at this higher rate, the special sequence is usually set up on a different group of reels and ordered printed separately. Later, the lab cuts these sequences into the regular prints.

Motion picture laboratories may be divided roughly into two classes: 1) straight labs and 2) service companies. The first specializes in film developing and printing, with perhaps titling and splicing services included. Those in the second class are usually complete organizations offering just about any film service a producer may need. Many are film producers themselves with an imposing roster of clients. Service labs can be especially helpful for those film makers who do not wish to invest heavily in production equipment or to have to go to more than one company for processing, sound recording, art work, music clearances, etc. The more complete service laboratory offers such handy "one-stop" service.

On the other hand, the average lab which confines its service to processing and printing only, often rent cutting rooms, Moviolas, etc. You may find their rates, especially in B&W, a little lower than some of the other companies charge. A general organization's most helpful service is probably its flat-rate sound recording, in which a producer may obtain sound recording, studio use, a narrator to read his script, background music, sound film, and processing. He may also receive supervisory help.

A good way to acquaint yourself with the services a laboratory offers is to carefully study its price list. First item is usually *Negative Developing*. Note here whether they develop negative, reversal, or both. Reversal labs customarily develop sound negative, though. The next item is *Daily Work Prints*. This is the price you pay for prints to use in editing the picture. If both negative and reversal are handled, the latter dailies might be included in a separate reversal section.

Fine Grain Prints, sometimes also called *Masters*, are low contrast positive prints on special stock. They are used to print dupe negatives. Fine grains may be considered equivalent to reversal originals, except that their emulsion position is different due to their being prints.

Dupe Negatives can be classified under a few subheadings: *Picture* refers to straight prints from fine grains or reversals; *Sound* refers to prints from sound track positive; *Composite* refers to a negative with sound and picture together for convenience in release printing; *A—B* refers to prints made from fine grains or reversal film in A—B rolls, and *Temp Dupe* is a cheap negative printed from a work print to get duplicate copies of the work print for the sound department and others.

Release Printing begins with the *First Trial Composite*, or *Answer Print*. This shows you what a print from your edited negative and sound track looks like. Following approval of the answer print, *Subsequent Prints* are ordered, and their price often depends upon the size of the order. *Replacements* are sections of print less than a reel in length made for replacing damaged film.

Color Printing may refer to both work prints and release printing. The latter is done *Sound* or *Silent* and *straight* or *A—B effects*. This gives four different prices for color release work in each quantity classification.

The various labs have slightly different working methods. Some will notch your film to control the printer light and fading device, while others apply a magnetic cueing mark on the film edge or notch a separate control film instead.

The film printers used by professional labs are equipped with a device that controls the brightness of the printing light. Thus the light intensity may be adjusted manually or automatically to conform with each scene in the reel as it passes through the printer. Printing light control is very important in color film printing as a means of modulating both the scene brightness and color saturation.

The maximum length of each printing reel is usually 400 feet, 800 feet, or 1200 feet, including leaders, depending on the individual lab. A few laboratories print from dupe negatives only and do not accept original camera negatives for printing purposes.

The length of fades and dissolves varies with some companies. It's necessary that you know how many frames in length your lab has established for this procedure when editing the work print for effects. Some labs offer a choice.

For more comprehensive details of the services you require, phone or write the laboratory you contemplate dealing with and request a copy of the company's catalogue and price list. The addresses of most of these companies are to be found in their advertisements which appear regularly in *American Cinematographer*. ■

A STUDY IN HORROR FILM PHOTOGRAPHY

Continued from Page 613

design because it lent the desired dramatic or pictorial effect. After the rented set pieces had been erected, studio technicians filled in the spaces with appropriate construction to unify the whole. The only set in the picture built in the conventional manner was the dungeon set.

The spectacular pendulum set occupied a whole sound stage and stretched from the floor to the rafters. To heighten the massive aspect of this set, the camera was mounted on a parallel at the opposite end of the stage and a 40mm Panavision wide-angle lens used. This enabled Crosby to frame the scene in his camera with extra space allowed at the bottom and at either side. These areas were then filled in later by printing-in process extensions of the set, effectively doubling its size on the screen.

Other matte shots, following Heller's original paintings, were used to establish exteriors of the castle. Scenes of waves dashing against cliffs were filmed on the Palos Verdes coast southwest of Hollywood. The camera was locked down tightly for steadiness and the cameraman who was to shoot the matte paintings went along to make sure the perspectives would match.

Photographically, "The Pit and the Pendulum" is a singular achievement in color mood lighting and the use of the moving camera. To Floyd Crosby, who won an Oscar for his photography of "Tahu" back in 1931, the challenge was one of reaching for top quality under difficult conditions and on a short shooting schedule. Moreover, the entire picture, with the exception of the short exterior opening sequence, required low-key photography, since everything that took place within the castle was in a somber mood. The first half of the action called for medium low-key, while the final half went to extreme low-key with nothing in between for relief.

The climactic action of the story is concerned mostly with one actor wandering through secret passages and catacombs, lured by the voice of his wife who is supposedly dead. Most of the low-key effect was achieved in the lighting of the set. A reasonable amount of front light had to be used on the actor's face, although occasionally it was possible to use just a line light and very little fill. In medium key sequences, Crosby said, faces were underexposed two-thirds of a stop and the background about a stop-and-a-half. For most extreme low-key shots faces were underexposed a stop-and-a-half. Illumination on the background was lowered to a point somewhere between 15 and 20 foot-candles where it would just hardly record on the film.

An important decision made prior to shooting was whether or not to use a flicker effect in the many scenes supposedly illuminated by torch light. Such effects are usually created by placing a fire pan in front of the source light. Crosby knew that if he once introduced the flicker effect he would have to retain it throughout the film. With so very much camera movement and so little time to shoot, he decided to dispense with the effect rather than run the risk of it being inconsistent in the intricate follow shots his aim was to keep the source light coming from the direction of the torches. There was a great deal of camera movement, most of it done with the aid of a large Chapman boom, with the action often continuing through four or five rooms without a cut. This meant that huge areas of the set had to be precisely lighted at one time.

"The sets were exceptionally well designed," Crosby observes, "and lent themselves very well to low-key photography. It still amazes me how much set we were able to get on so low a budget. We had some huge sets and, of course, the bigger the set the more lights that have to be rigged, all of which takes time. Sometimes we would get all set to shoot and then get a better idea. In the 'pendulum' sequence, for example, we originally rigged the lights high up on the stage, but when we were ready to shoot we realized that making the shadow of the pendulum cut across the figures in the background would be most effective. We had to stop and re-set the lights at a lower angle so the dramatic shadow would not be lost in the depths of the set."

Crosby displayed a bit of camera magic, born of long years of experience, in shooting the opening exterior prologue—a sequence set at the seashore supposedly against a glowing sky. The day which the company chose for the location, however, had anything but the right mood—bright and sunny with a beautiful blue sky. By using a

pola-screen on the lens to darken the sky plus underexposure, Crosby produced the ominous mood called for in the script.

Extremely effective in the film is a series of flashbacks in which the main character, teetering on the edge of insanity, relives traumatic experiences from his tortured past. Realizing that flashbacks can be deadly if they are not well-executed, Corman, Heller and Crosby put their heads together to devise a unique effect that would subjectively convey the character's horror in dredging up the nightmares lurking in his sub-conscious. They wanted these flashbacks to have a strangeness, a semi-dream quality—twisted and distorted because they were being experienced by someone on the rim of madness who did not know the full facts or was too shocked to recall them accurately. In order to provide a definite visual demarcation between the story of the moment (reality) and what had happened in the past, it was decided to shoot the main story in full color and the flashbacks in monochrome since, as many psychiatrists maintain, most people dream in "black-and-white."

The flashbacks were accordingly filmed in monochrome and Crosby utilized wide-angle lenses, violent camera movement and tilted camera angles to point up the character's feeling of hysteria. The finished sequences were printed on blue-tinted stock which was then toned red during development — producing the effect of a two-tone image. The highlights went blue — while the shadows (represented by areas where more emulsion was present) held the dye and were rendered as red, producing a realistic bloody quality. To further enhance the atmosphere of horror, the image was then run through an optical printer where the edges were vignetted and a twisted linear distortion was introduced. The result on the screen is one of genuine shock, an almost too-real-to bear nightmare quality starkly suggesting madness and bloody violence. Like the rest of the picture, the flashback sequences reflect thought, careful planning and imagination. ■

THE VIOLENCE CAMERA

Continued from Page 599

in bold closeups of men cutting and slashing with their sharp-edged weapons. Thus it was that we conceived a light-weight shield for camera and operator that would permit the latter to move right up to a swordsman and film his actions in a most natural manner—bringing the audience virtually into the midst of the fray.

Photos at the top of page 599 show this piece of equipment being strapped on the camera operator and its use in filming a closeup of actor James Mason using a sword ostensibly in combat.

The curved shield was made of a combination of fiberglass and steel matting laid over a framework of light steel, and having a plexiglass-covered porthole in the front for the camera lens. Because we were shooting with Panavision lenses, it was necessary also to use these heavy lenses on the Arriflex-35 camera to which the shield was attached. Where normally (with the camera mounted with conventional lenses) the shield and camera would be used by the operator hand-held, we now had to add rubber-padded shoulder braces to the shield which enabled the operator to carry much of the load on his shoulders and also make it easier for him to steady the camera and maneuver it when filming fast action. For the closeups described, the actor usually flailed away at the protective shield with his sword as the camera recorded his action on film.

The impact of the sword thrusts of the actor added to the weight of this "violence camera" rig was such that during the first half hour it was used, the camera operator was literally beaten to his knees. He fell forward, and for a moment it was feared he had been seriously injured and that the Panavision lens—insured, incidentally for $18,000—had been smashed. Luckily, neither man or camera had been injured.

The use of this camera-shield combination made it possible to shoot closeups of a swordsman attacking and responding to attack in a manner that could not be filmed in any other way; the sensation of lurching, the violence of spinning backwards, the effect of instability and participation could be vividly recorded only with the camera right in the midst of the action.

Continued on Page 626

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THE VIOLENCE CAMERA

Continued from Page 624

Another aspect of this innovation is that it made possible some tricky cutting that gave tremendous impact to the battle sequence. We shot the two "halves" of the fight facing in opposite directions, and also moved the action around on the locale in order to cover it with greater scope. In this way we were able to complete this phase of shooting in about two hours time, whereas it would have taken us two days, using conventional methods.

Here we made an interesting discovery. By reversing the fight footage shot in this way—that is, with the negative reversed—we obtained a whole new series of action scenes.

This unusual approach to shooting the fight sequence tied in directly with a motif of photography which we had elected to use throughout the picture. In photographing action supposedly taking place in the year 1718, we speculated on what we could do to make it visually unique and enhance its dimension. Most historical motion pictures look like the face on a dollar bill—as if everyone wrote with a feather quill. It has a stilted, dull "schoolbook" look.

We decided that in order to make our photography visually exciting, we would impose over its Early American aspect something of an alien quality. So it was that in order to impart a sort of feudal atmosphere to scenes, a Japanese style of silhouette and color was adopted. Audiences, generally, will not be aware of this influence—only of something different and unusual.

This same thought was carried through to the costuming. On James Mason's jacket, for example, we added little shoulder peaks that would not normally be there, and there are similar little touches in the costumes of other actors that suggest an oriental influence. Even the men's use of swords was given something of the Samurai look, by having them directed always toward the camera lens. In the matter of colors, backgrounds often had the aspect of being "smeared" and the foregrounds were held in sharp focus which further emphasized the Japanese print look.

In photographing "The Land We Love," Ted McCord demonstrated marked resourcefulness in the pictorial composition of scenes. Close by our Catalina location, scrubby little gorse-like pine, with the windswept look so familiar in Japanese prints, grew at the edge of the cliffs. McCord incorporated one of these in the composition of a scene to lend an alien undertone to our early American story. Another time, he employed an effective trick of color separation to enhance visually the apparent depth of a long shot. He had the greens man locate, cut and bring to the set location some twenty different shrub trees, each carefully selected and having a different tone of green. These were "planted" within the scene beginning in the foreground and stretching toward the background, and graduated according to their respective colors which ranged from dark bluish-green to light yellow-green. The effect thus achieved was that of looking down a corridor of greenery into deep woods. By throwing booster light into the scene at intervals to accentuate separation, a luminous, three-dimensional quality was created.

McCord disdained admonitions of the film laboratory against shooting certain scenes under conditions supposedly beyond the latitude of the film. As a result, a striking day-for-night effect was achieved in several late afternoon and early evening scenes which were printed in an amber overtone instead of blue which marks so many color shots of this kind seen today.

In his daring and imaginative approach to the photography of many scenes, McCord achieved results only the unshackled cinematographer could. He is one to be trusted with a free reign, for he knows from experience that the limitations so often imposed on cameramen fail to stand up under test. He shot the closing scene of the picture with the camera facing directly into the sun and its glaring "sun stream" reflection on the water. This was printed as far as possible in the amber scale with seven points of magenta added, producing a scene of unearthly beauty.

McCord is a mood photographer and all of his techniques are slanted toward the service of the artist. It has been said that "he is such a gifted technician that he does not seem to be technical at all." Thus, it always comes as a surprise to see him using an exposure meter or doing anything directly related to technique. All of this has long since become second nature to him, McCord will tell you.

He will rarely photograph a scene which does not have something unique in its composition. An example is one

scene he shot with the lens pointing directly at the sun, so that it became a splintered, sharred thing in the Panavision lens, then arranged to have James Mason's head emerge into the frame momentarily, shutting out the sun as he spoke a single line of dialog, then move on, allowing the sunlight to blast into the lens again. The effect is arresting, not as a trick, but as a realistic impression of the way a person would actually appear who momentarily eclipsed the sun.

Camera operator Dick Batcheller really received a workout on this picture. With McCord's endless innovations and improvisations, it seemed that Batcheller was constantly working on his stomach, flat on his back, up to his neck in water or in the middle of a fight scene.

The easiest part of shooting "The Land We Love" was done in Catalina Canyon, just five minutes from the Island's port of Avalon. The hardest work encountered by crew and cast was on a location site on the opposite side of the island, a wilderness area an hour's journey overland from Avalon. To get down to the beach where our shooting was scheduled, it was necessary to lower all camera and lighting equipment down sheer cliffs, using cables and heavy ropes. Here the grips did a heroic job, especially in moving the heavy dollies and tracks down to the beach and setting them up for use.

The power cabling problem proved enormous, because it was necessary to run lines from the generators high up on the cliffs to the shooting area on the beach. We anticipated sound problems in shooting right next to the pounding surf, but use of a new type directional microphone gave us most effective results, and as a consequence we were able to use all of the original sound recorded there and not have to resort to dubbing.

When working with Ted McCord I turn over to him all authority and responsibility for the pictorial results of the production. I discuss with him the important details of the picture, tell him what my best hopes are, and endeavor to create for him a clear picture of what I have in mind as to the visual approach. To get the production on film, McCord runs the show, frames as he sees fit, and sometimes arranges to modify the action in a scene when it will enhance it dramatically or pictorially. I have watched him spend three hours working on a scene to achieve some pictorial effect, then move to the next set-up and boldly rip through an intricate shot in no time at all. He averaged twenty set-ups a day on this picture, even under the most trying conditions.

And that is how we were able to shoot a fully-covered, fully-integrated color Panavision feature in just sixteen days. ■

THINGS TO REMEMBER WHEN SHOOTING EXTERIORS

Continued from Page 602

what compensations you should consider for the type of film you will be using. As a rule, each commercial laboratory has established certain standards for developing and printing film which in turn require certain considerations on the part of the cinematographer, particularly in the matter of lighting and contrast ratios. This is especially true in the production of program films for television.

In the matter of arriving at the correct exposure to use on an exterior scene, the basic problem (within the latitude of the film used) is to expose it in such a way that light areas are never overexposed and extreme dark areas are not underexposed. This sometimes depends as much upon the type of film used as it does on the amount of light that reaches the film, i.e., the exposure.

Quite often, when a high-speed emulsion is used, the cameraman is faced with a prevailing light situation in which he will get overexposure with the lens set at its smallest stop. For this there are two remedies: 1) use a neutral density filter over the lens to cut down the amount of light reaching the film, or 2)—where the camera has a variable shutter—reduce the shutter opening, thus effectively reducing the amount of light reaching the film during the exposure interval.

The latter alternative poses a question of exposure or f/stop compensation for the change in shutter opening. In other words, if a meter reading of the prevailing light indicates you should shoot at f/1.9 at 24 fps, and your shutter opening is 170° what will the lens setting be if you reduce the shutter opening to, say, 90°? Obviously it's impractical if not undesirable to have to figure this out on

paper. A glance at the exposure/shutter compensating tables in the *American Cinematographer Manual* (Pages 214 to 217 incl.) will give a quick and accurate answer in terms of *shutter speed*. With this figure, you check your prevailing light with your exposure meter accordingly to arrive at the correct f/ stop to use.

If your camera has a variable shutter with the various openings indicated in terms of "Open—¼ open—½ open—closed", etc., as is the case with some 16mm cameras, it will be necessary for you to know the exposure interval for each shutter opening—information usually to be found in the instruction booklet provided for the camera.

The following condensed exposure-shutter compensating table may be useful:

Shutter Opening	Exposure Interval at 24 fps*
170°	1/50 sec.
140°	1/60 sec.
90°	1/100 sec.
60°	1/150 sec.
40°	1/200 sec.
20°	1/500 sec.

*Using precise mathematics, these exposure intervals work out to a small fraction above or below the figures shown. However, for all practical purposes and ease of calculation, the figures shown will render normal exposure results.

Experienced cinematographers know, of course that there is more to using an exposure meter than simply pointing it at the scene to be filmed and reading the scale indicator. Reflected light meters usually "see" and measure a wider angle of the scene than that taken in by the camera lens. For this reason, more accurate readings will be obtained by using the meter closer to the subject than at camera position.

More than once in these pages readers have been cautioned against following reflected light meter readings of scenes in which a preponderance of bright sky or water prevails. In such instances, the meter will be influenced by the excessive bright area in the scene with the result that normal and dark areas will be underexposed. A common example is where a person is photographed from a low angle against clear, bright sky. The alternative that produces the correct exposure result, of course, is to determine the correct exposure for your *subject*. This you do by taking a meter reading of the person's face at close range.

Such exposure problems can be minimized considerably by using an incident light meter, which measures the light *falling* on the scene or subject instead of light *reflected* from it. Incident light meters such as the Norwood, Spectra, and Brockway-Sekonic have a hemisphere light collector which enables the meter's photocell to properly evaluate light falling on the camera side of the scene or subject. Over-readings induced by bright sky or background areas, which must be considered when using a reflected light meter, are rarely if ever a problem with incident light meters.

Probably there is nothing so exasperating to a cinematographer as discovering light flares in the film he shot—especially if retakes are impossible or at least will add considerable extra cost to the production. The preventive, of course, is to use a sunshade on the lens or camera, but even when some types of sunshades are used—those that are too small or too shallow—flare sometimes occurs where the photographer has tilted the camera upward and forgotten to check for sunlight striking the lens directly.

(Continued Next Month)

BEHIND THE CAMERAS

Continued from Page 594

WARNER BROS.

BURT GLENNON, "Lawman"*.

ROBT. TOBEY, ASC, LEWIS JENNINGS, "Maverick"*.

RALPH WOOLSEY, ASC, LEWIS JENNINGS, HAROLD STINE, ASC, "Surfside 6"*.

CHARLES LAWTON, ASC, "Lovers Must Learn" (shooting in Italy) with Troy Donahue and Suzanne Pleshette. Delmer Daves, producer-director.

ROBERT HOFFMAN, "Black Gold." Les Martinson, director.

GLEN MACWILLIAMS, ASC, "Cheyenne"*.

FRANK CARSON, RALPH WOOLSEY, ASC, J. PEVERELL MARLEY, ASC, "77 Sunset Strip"*.

RAY FERNSTROM, ASC, HAROLD STINE, ASC, "Roaring Twenties"*.

J. PEVERELL MARLEY, ASC, ROBERT HOFFMAN, "Hawaiian Eye"*.

FRANK CARSON, JACK MARQUETTE, "Room for One More"*.

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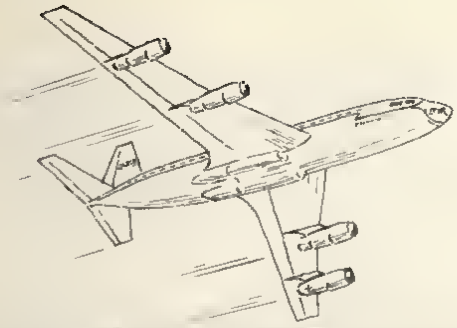
MONROE ASKINS, "Rip Cord"*.

BRICK MARQUARD, "Everglades"*.

ROBERT WYCOFF, MONROE ASKINS, "King of Diamonds"*.

ROBERT WYCOFF, Commercial*. ■



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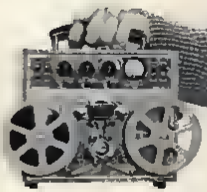

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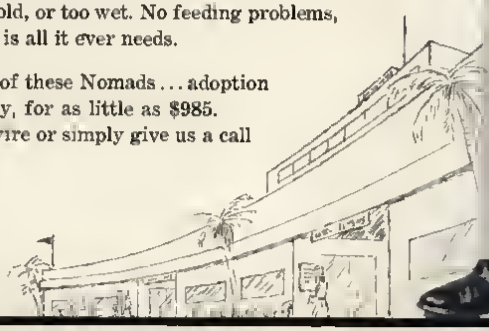

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